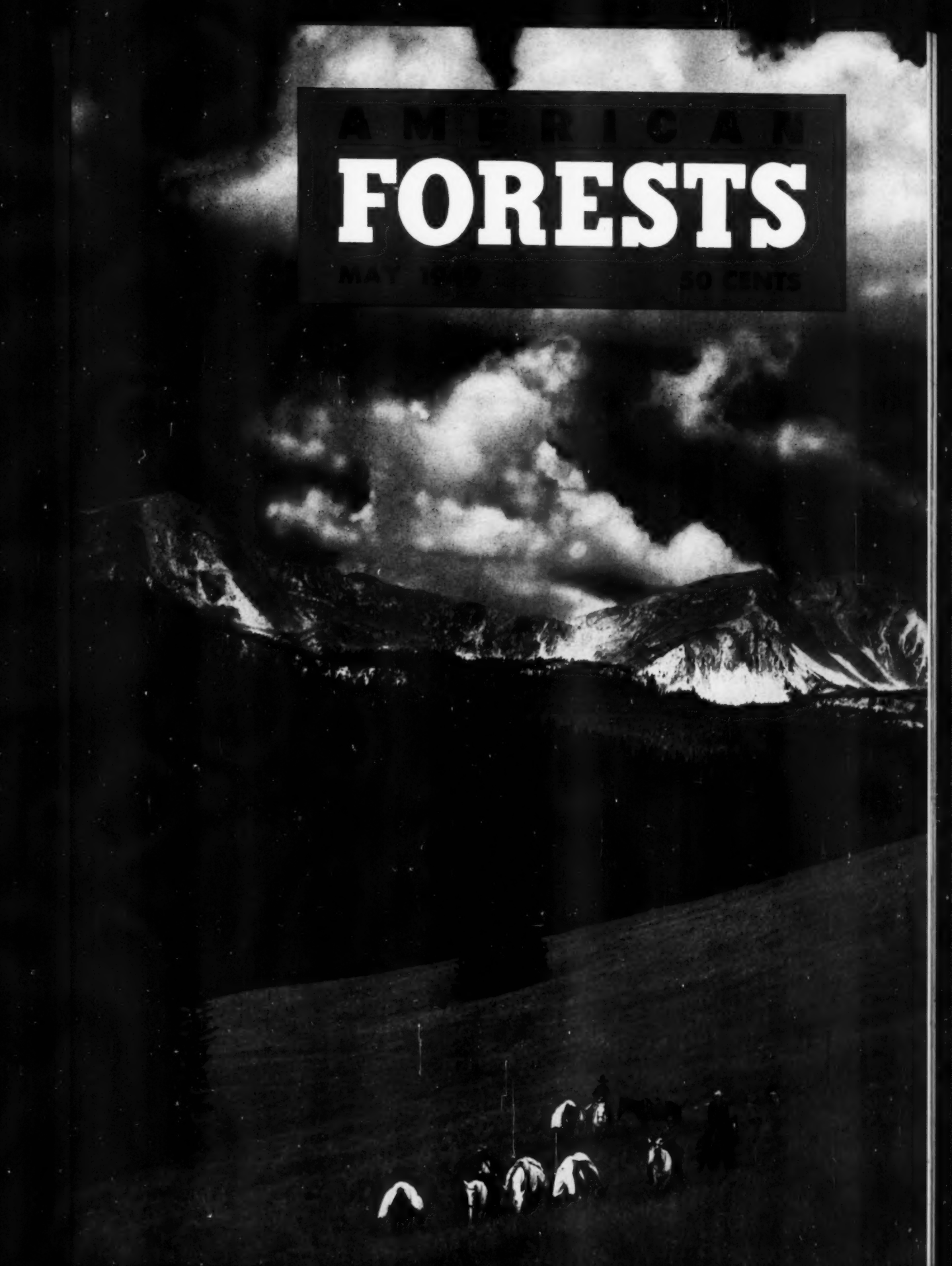
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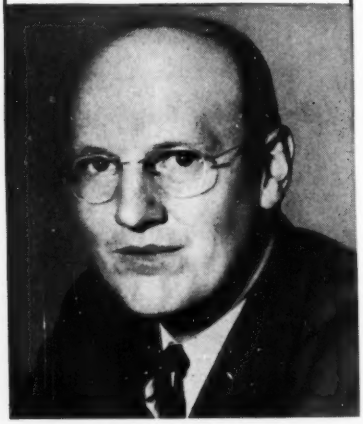

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The American Forestry Association is a national organization—independent and non-political in character—for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and the part they play in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

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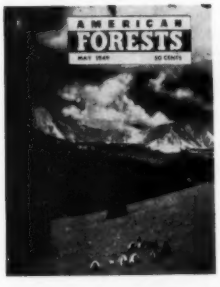

THE COVER

This cover shot taken in New Mexico's Santa Fe National Forest is a striking example of what Bernard Frank and Anthony Netboy are talking about in "Cradle of Rivers" starting on page six. In other words, a "working watershed." Photographer Harold D. Walter was deep in the Pecos wilderness area when he took this picture of mesa, virgin spruce and the Truchas Peaks—the 12,000 foot summits that look out over a network of streams flowing into the Pecos River. This summer, from August 29 to September 11 to be exact, The American Forestry Association's Trail Riders of the Wilderness will conduct a pioneer expedition into this picturesque area with riders given an opportunity to study the watershed at close range.

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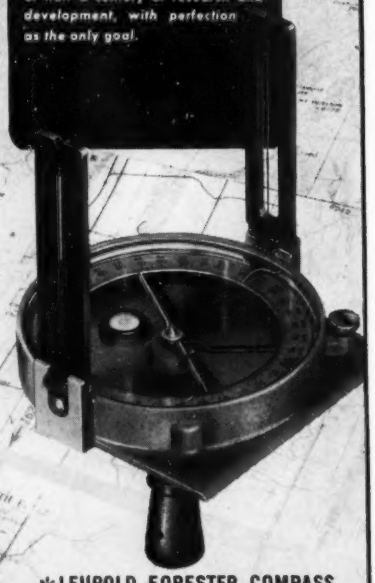

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LETTERS TO THE EDITOR

How a Dean Was "Defrocked"

Your March issue was especially interesting, particularly Josh Cope's "We Make a Sauna."

So Josh has gone through a Finnish bath! I wonder if his home sauna has all the appurtenances of a Finnish one? Our First World's Forestry Congress American group had a wonderful forestry excursion in Finland back in 1926—just after the sessions in Rome. And all but one of the party partook of a sauna; one dean reneged. Our party was replete with forestry deans, incidentally.

Another dean and I happened to share a sauna bath room with the accompanying bath woman. She had obviously reached the years of discretion, and of course knew no English but she certainly had a sense of humor.

I recall we undressed in a little room across a narrow hall from the bath room

and had been told by our friend Dr. Saari to leave our robes in the dressing room. I happened to enter the bath room first—and there was the bath woman, smiling. Well, I figured that I was in Suomi and must do as the Finns did—so the bath started.

Soon the dean entered the steaming room wearing his bath robe. The lady evidently told him by gestures and words to leave his toga outside. The dean demurred, asking me what the lady was doing in there anyway and what she was saying. I could answer only his first question. Anyway, the dean stood around trying to tell her to get out—still clutching his bath robe around him. She kept talking and gesticulating and finally worked her way around behind the dean—and all of a sudden snatched the robe from his deanship, laughing heartily the meanwhile.

There stood a forestry dean in all his modesty—probably blushing violently, but the steaming heat hid the blush. Well, he grudgingly resigned himself to the old Finnish custom and a good bath was had by both of us! And as Mr. Cope will agree, a Finnish bath is a BATH, and how! From Cope's description of his sauna I am almost persuaded to attempt one here at Ville View!

John D. Guthrie

Charlotte Court House, Virginia

Outdoorsmen in the Making?

In your excellent article "Outdoorsmen in the Making" (April issue) I feel sure you would not have published those photographs—or at least not without criticizing—if you had noted the flagrant violation of the safety "motif" in their posing.

In the first photo "Baptiste" may be pointing out some point of valuable woodlore to his one companion but his example of leaning on his gun with its muzzle pointing almost directly into his chest or chin while standing in none too good balance in snow—well it makes one hunter who has followed the game for over half a century shudder. I would say that the neophyte is giving the rest of us a far better example of safety in the woods than the expert in this picture.

In the second picture the lad on the left would be booted bodily out of our deer camp if he cleaned a gun with its muzzle so directed *after having been once told better.*

That the gun is "empty," "has the safety on," "the hammer is down" and all such alibis may not sound so bad if nothing happens as is generally the case, but they are mighty weak sounding alibis over the body of a dead comrade. Accidents do not *happen.* They are *caused.* And often by just such thoughtless violation of the simpler safety rules as these.

Your magazine is fine and I like it a lot and often wish that I were a person of sufficient means to give your progress better support. And I assure you that nothing more is meant or implied in these criticisms than that which you may construe to be constructive. And nothing less.

Joseph B. Gable

Stewartstown, Pennsylvania

How'sthatagain?

I see that you insist on spelling Douglas Fir, Douglasfir; Bald Cypress, Baldcypress. You must be very highly educated people, your head is crammed that full there is no room for common sense. My father was no full Martin and my mother was no Martin at all. Therefore I must write my name

Elmerjmartin

Letter From A Future Forester

I want to start this letter by telling you how sorry I am for not getting my renewal for *American Forests* in on time and to thank you sincerely for your patience concerning my tardiness. As things worked out, I am only employed on Saturdays and, consequently, have not had the money to send you.

I am only sixteen years old and a Junior in high school but, through my activities as a Boy Scout, I have come to realize the importance of the conservation movement and have chosen forestry as my life work. I am also a subscriber to the Ohio Conservation Bulletin and this magazine, combined with *American Forests,* has made me an avid conservationist. Throughout my schooling, up to this point, I have yet to see education place a great stress on conservation. I am of the opinion, as are many others, that, unless the youth of our nation are instilled with the ideals of conservation of our natural resources, we will have to pay the consequences in the not-too-distant future. I think that every high school in the country should have a course in conservation.

Charles P. Craig

Wooster, Ohio

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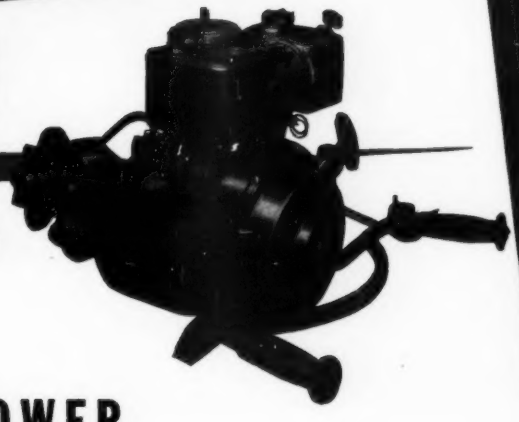

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WASHINGTON LOOKOUT

By A. G. HALL

How to get along with less money—this is the problem faced by administrators of the national forests in Fiscal Year 1950.

Total Forest Service appropriation, as passed by the House of Representatives, shows a net increase of $73,325 over the 1949 figure, but for the protection and management of the national forests, the Department of Agriculture appropriation bill makes a reduction of $233,175. The $24,971,000 granted for this purpose by the House is $1,518,500 less than that proposed by the Bureau of the Budget. Pay raises, granted by the 80th Congress, will make a further dent in the effectiveness of forest administration. It will be necessary for the Forest Service to absorb some $2,000,000 in increased pay rates.

To make matters worse for the Service, the centralized printing and binding fund of the Department of Agriculture has been discontinued. Accordingly, the Forest Service will have to absorb its share of the Department's printing bill, which last year totaled $1,800,000.

For the Service as a whole, the effective reduction, considering the necessity of absorbing payroll increases and printing allotments, amounts to $3,229,000.

While its management of the federal lands appears to be in for a rough year, the Service activities in state and private forestry are destined for a banner year. For cooperative work in forest fire prevention and suppression, the full $9,000,000 limit has again been approved. And for farm and other private forestry cooperation, the House granted an increase of $290,500 above the 1949 figure, exceeding the budget estimates by $285,500. This will step up the reforestation program by $100,000 and the on-the-ground technical assistance to small forest owners by $185,500.

Representative Bob Sikes of Florida rallied the congressional support to launch this expanded program of state and private forestry action. In this he was supported by state foresters through whom most of the work will be conducted. The House attitude on these items augurs well for the success of H.R. 2296, approved by a subcommittee of the Committee on Agriculture, to expand this work further over the next five years.

National forests, however, did not have such champions to help steer their destinies through the Appropriation Committee's deliberations. And too few came to their rescue on the floor of the House. Consequently the national forests will be expected to provide all services on an average expenditure of less than fourteen cents an acre. Gross receipts from the forests total more than $30,000,000.

The committee's reasoning merits study. In its belief, "the work of the Forest Service is in need of extensive and intensive study and review for the purpose of improving the administrative setup and the distribution among the various units of its administrative responsibilities." It directs the Chief of the Forest Service to utilize not more than $25,000 from the Forest Service appropriation to make such a study, the results of which will be reported to the committee when it considers the estimates for the Forest Service for Fiscal Year 1951.

In suggesting ways in which the Service can operate within its reduced budget, the committee recommends charging for use of recreational facilities, further reduction of grazing of domestic stock, increase in grazing fees, reduction of game populations by issuing hunting licenses and fixing bag limits. These suggestions, and the lack of funds with which to do otherwise, leave the Service caught between the national forest user and the Congress. It means that the Service, which has just weathered a skirmish with western stockmen must prepare itself to do battle with them again if it is guided, as it must be, by the following statement in the committee's report:

> "Another connection in which the financial position of the Government with respect to the national forests can be improved is in the management of the grazing upon the forest ranges. In the first place the number of grazing permits in many areas is greatly in excess of the capacity of the range. This overgrazing results in the depredation of the range, followed by soil erosion and, eventually, floods. These conditions resulting from improper administration of the ranges entail, first, appropriations for reseeding the ranges and, second, appropriations for flood control, the need for both of which can be obviated through the simple process of limiting the number of grazing permits to the grazing capacity of the ranges. The Forest Service has full authority to fix the number of grazing

permits on any area, but in many cases has not exercised it to the point necessary to prevent depredation. Many users of the national forest grazing lands are interested in what is termed reseeding but which amounts to planting hay or forage. In many areas this would be practical. However, it is believed that the Department should give attention to the possibility of charging separate and additional fees in certain areas, the proceeds from which would be used by the Department for planting forage."

A framed copy of that statement should be sent to every supervisor and ranger dealing with grazing problems, along with a copy of a manual on how to get along with stockmen. The committee apparently overlooked the fact that even if all grazing were eliminated at once, revegetation would be necessary on many areas to prevent erosion and to help prevent floods. Further, the Service is now engaged in a stock reduction program.

Similarly, the Forest Service men will run into considerable difficulty with state game commissions when they try to regulate national forest game populations which have long been considered state property.

Local forest experimental units were indicated as projects for the several states, rather than for the federal government. The committee suggests that they be established under the appropriate state agency with federal relations similar to those for other agricultural experiment stations.

Supporters of the program for establishment of the Quetico-Superior International Peace Memorial Forest will fail to find reasoning behind the elimination of $100,000 budgeted for purchase of private lands within the Superior National Forest. The Budget Bureau had very carefully taken this amount from the "regular" acquisition funds in order to start the program authorized by Public Law 733 of the 80th Congress. Purpose of the item was to provide for acquisition of resort and other private areas in an effort to maintain the primitive character of the Superior roadless areas. Total authorization for the project is $500,000. The longer the delay in purchasing such land, the greater the ultimate purchase price will be. For example, private owners now will have at least another year in which to develop nonwilderness facilities.

Other Forest Service items were approved at essentially the same amounts as requested in the budget; forest and range management investigations, $2,808,500; forest products research, $1,172,000; forest resources investigations (forest survey) $866,-

(*Turn to page* 37)

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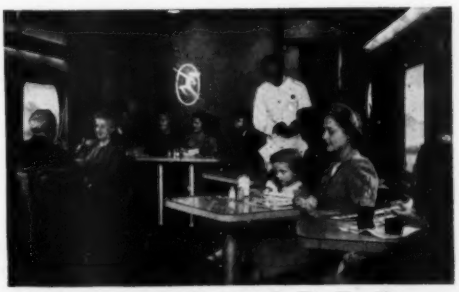

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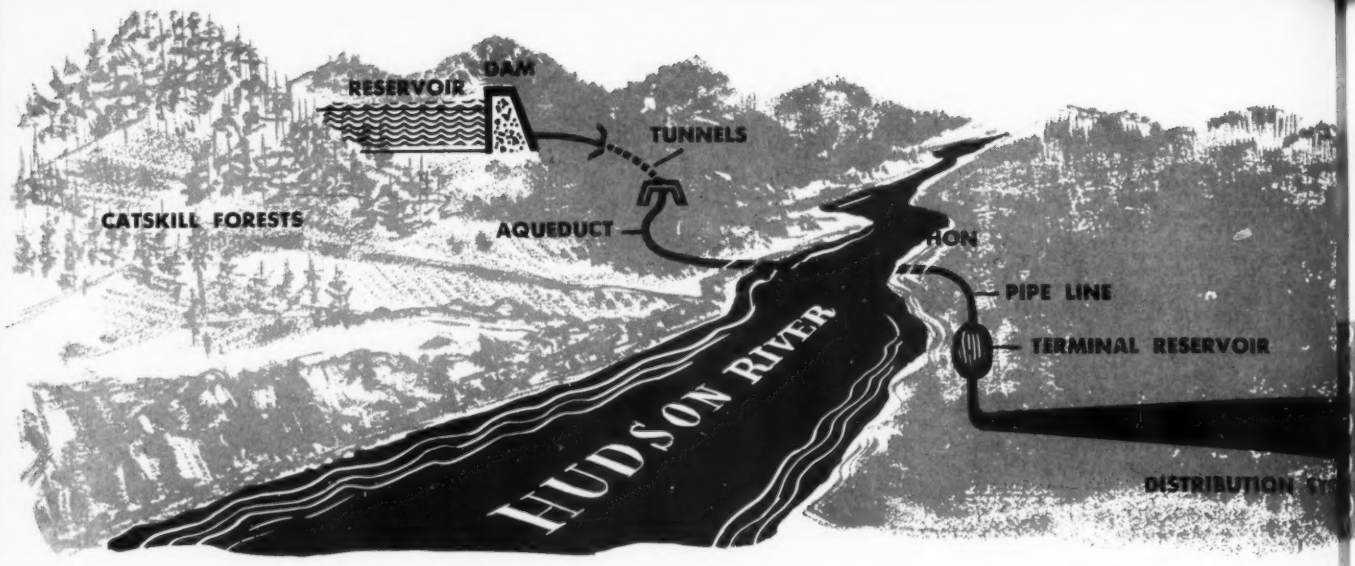
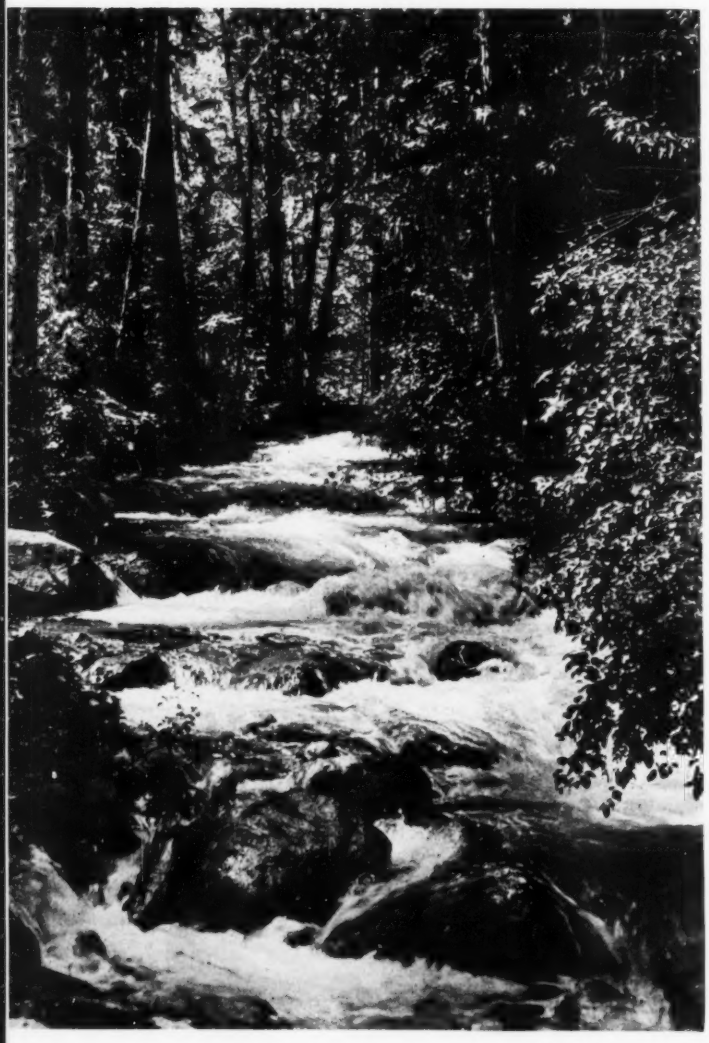


Water for New York's millions is gathered in the forested hills rising above the Hudson

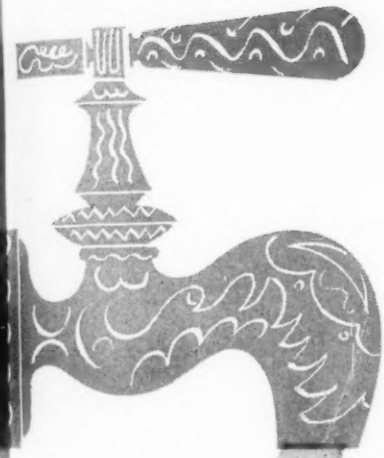


Lloyd F. Ryan, USFS

A healthy watershed—the "cradle of rivers"

K. D. Swan, USFS

What happens when fire sweeps over a watershed



Cradles of Rivers

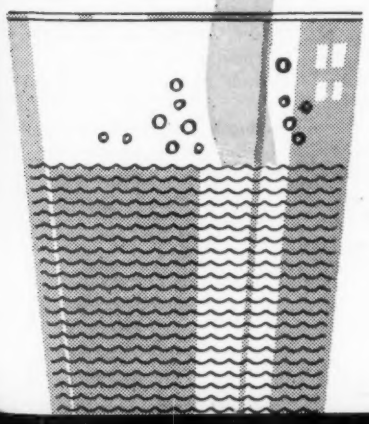
By BERNARD FRANK and ANTHONY NETBOY

Nothing is more essential to life than water—yet how much do you know about the watershed at the other end of your kitchen spigots? Or the elemental facts that govern the life of your favorite river?

IT is a fact of human nature that the ordinary is taken for granted, while the unusual receives attention—and headlines.

To most Americans, the supply and behavior of water are not even topics of the most casual discussion. The average citizen of most eastern and even many western towns becomes conscious of water problems only when sudden or prolonged shortages, muddy or otherwise unpalatable drinking water, or startling, sometimes disastrous floods rudely upset the even tenor of domestic or business activity. Often it takes repeated disruptions of electric power or water services, or recurrent losses of life, property, and earnings to shock us out of our normal complacency. And even then few people look beyond immediate water troubles to the sources on the watersheds often far removed from their familiar surroundings.

Few city folk, for example, think of the constant efforts and heavy outlays which go into the treatment and distribution of the safe water that is piped into their homes. Until they become victims of rampaging rivers, few people who dwell in perilously-situated valley bottoms give any heed to the build-up of flood-aggravating conditions on the watersheds in which they live.



Essentially Americans have paid excessive attention to the abnormal aspects of waterflow and not enough to its normal, day in and day out behavior. It is as if medical scientists concentrated entirely on the abnormal workings—the breakdowns—of the human organs and ignored their normal, healthy functioning. Yet, if we are to make any headway in solving our growing water problems—or get the nation to face more realistically the penalties of ignoring them—we must become more fully aware of the elemental facts that govern the lives of rivers and normal operations of the "cradles" in which they are nurtured.

In plain language, a watershed is the area which supplies a given water course. It comprises the slopes, ridges and valleys on which precipitation falls and works its way, above or below ground, to the channels of the component brooks, creeks, streams and rivers. It may be visualized as a series of intimately connected drainage basins whose watercourses, like the branches of a tree, reach out in various directions to draw moisture and precipitation from the land and feed it into the main trunk.

Watersheds have many shapes and sizes and varied topography, ranging from level valley floor or tablelands to precipitous mountain crags. A watershed may embrace millions of acres, like that of the Missouri River, and enclose numerous tributaries of diminishing size.

Our watersheds differ enormously in climatic and geologic structure. A major watershed like that which feeds the majestic Mississippi River records an annual precipitation ranging from under five inches on the headwaters of the Bighorn River, in Wyoming, to 100 inches on the headwaters of the Little Tennessee in North Carolina. The higher slopes of this diverse area may be steep and bare, underlain with solid or cavernous limestone, or perhaps fractured rock. The soils may vary from thin sands that take in water readily but let it out equally fast, to deep, tight clays that absorb water slowly, swell up when wet, and crack when dry.

A familiar watershed is that of Rock Creek, a small tributary of the Potomac River which flows through the heart of the nation's capital. With an area of about seventy square miles, it harbors several hundred thousand people in Washington and the surrounding Maryland countryside. Its elevation ranges from about 500 feet in the Piedmont to sea level in the Coastal Plain where it enters tidewater. Even the difference of 200 feet elevation between Chevy Chase or Bethesda, Maryland, and downtown Washington leads to variations in daily temperature of as much as seven degrees, thus giving government workers who dwell in the suburbs a nightly respite from oppressive summer heat. Although Rock Creek watershed averages some forty-two inches of rainfall a year, only about fourteen inches actually become streamflow. The rest is evaporated from the land, used up by vegetation, or sinks into deep rock crevices.

Originally covered with deciduous forest, the area is now largely in farms and residential communities.

One of the many mountain streams that feed into the Colorado River—water so vital to the Southwest

Whatever forest growth is left is confined mainly to the rougher, steeper areas.

The alteration of the watershed through agriculture, logging, and encroachment of residential communities has greatly changed the behavior of Rock Creek. Once its flow was clear, steady and unpolluted. Rain or melting snow soaked readily into the well-protected soil. Today, much of the flow issues directly from dirty and paved surfaces, and compacted or eroded crop and pasture land. As a result, the stream rises rapidly after every storm and becomes discolored with yellowish-red silt. Frequently the usually quiet creek tops its banks, as in February and August of 1948, and runs to a minor flood. And the waters are now so contaminated with sewage, especially within the environs of metropolitan Washington, that they are unsafe even for wading.

Under pristine conditions the soil, cover, and moisture supply of a watershed tend to be in balance. Plant growth is adjusted to the rainfall and stream channels to the runoff they must carry.

The natural balance, however, is never static, even under virgin conditions. Climatic forces, along with the growth and decay of plants, are constantly at work, gradually and imperceptibly wearing down the surface of the land in one place, building it up in another. Rocks are gradually weathering to make soil material, and soil and organic matter creep downward eventually to be deposited on the floodplains or settle in the deltas. The drainage patterns as well as stream and river channels reflect the slowly altering landscape.

In years of scant rainfall there is relatively little erosion under natural conditions and not much sediment is washed into the channels, but as there is less flow to carry it off, the stream beds tend to rise, thus reducing the water-carrying capacity of the channels. Also, when rainfall is scarce, a corresponding decline occurs in the vigor and growth of plant life. The rains that come during such relatively arid periods loosen the poorly-protected soils and correspondingly augment the flow of sediment. These tendencies are noted particularly in the drier regions.

In periods of abundant rainfall, on the other hand, there is more water available to bleed and carry off the soil or rock material. At the same time, the soil's resistance to the impact of rain is increased by the return of a rich, protective plant cover. Stream flow is heightened and speeded up, and this, together with the fact that channel capacities had been lowered in previous drier periods, at first causes higher flood stages. At the same time, however, the water now has more ability to pick up and carry off materials accumulated in the river beds, and thus channels are again deepened.

In short, under natural conditions the cyclical changes in stream regimen—while important over the ages—are barely perceptible. Drainage patterns seem fixed and only careful, long-continued observations can detect the slight alterations.

Like individuals, every watershed is unique. Even if the patterns of rainfall, soils, and plant cover are alike, one may have short and steep slopes and another long and gentle slopes. Some watersheds are broad and rounded in outline, with few tributary streams, favoring quick concentration of flow following rain or thaw; others are elongated and narrow, with many tributaries along the main stem, thus favoring relatively slow concentration of runoff into the major channel.

The Missouri-Mississippi river system drains the largest watershed in the United States—nearly 1,250,000 square miles. This vast area, stretching across one-third of the United States, gets about thirty inches of rainfall a year. This supply, however, yields only about seven inches of flow at the mouth. But the Father of Waters is an undependable stream; the yearly discharge may run as high as 386 percent of the average, or dribble down to only sixteen percent.

What does this mean in terms of supply? First, most of the precipitation (seventy-seven percent) is lost by evaporation—from the land and water surface—before it reaches the river's mouth. (If we could somehow make available for our use only six of the twenty-three inches of water thus lost annually by evaporation, we would have enough to supply the domestic, municipal, and industrial requirements of the entire United States, and in addition be able to irrigate some seventy million acres in our arid areas.) Secondly, the gigantic river's flow is quite variable, indicating a fluctuating distribution of rainfall on the watershed over the years. Low water too frequently creates hazards to navigation on the Mississippi—as anyone who has taken a trip from St. Louis to New Orleans knows — and floods recur with sickening monotony.

By contrast, the St. Lawrence River is a dependable and well-behaved stream, not given to roaring rampages. Its maximum discharge is only twice the average and six times the minimum. What is the reason for its relatively even temper? Situated in a cool, humid climate, where much of the precipitation is handily stored on the ground in the form of snow that melts slowly during the long spring season, the St. Lawrence does not have to accept quick, sudden flows of tumbling mountain streams. And the occurrence of the Great Lakes, with their vast capacity for storing precipitation, acts as a powerful stabilizing influence on the waterway below.

How different from the St. Lawrence are some of our major western rivers! Located in the arid regions, they are starved for water most of the year, and whatever precipitation they get is quickly evaporated in the dry atmosphere. On the Rio Grande and Gila rivers, for example, over ninety percent of the scanty rainfall is lost in this manner. Whatever water appears in the streams originates almost entirely as melting snow in the distant lofty, humid mountains. Early in the spring the Rio Grande and Gila rivers fill up rapidly, but in the hot summer months, when most needed by thirsty men, plants, and animals, they are virtually dry.

The sediment discharge of our rivers is also an important factor in the stability of our watersheds and hence in the economic stability of the lives of people and communities. Every stream carries a certain amount of muck in suspension, such as clay and silt, or gravel and boulders moved along the bottom of channels.

We know little about the sediment discharges of American rivers before the white man appeared on this continent and began to plow up the hill lands, tear up the stream banks, burn the forests, and ribbon the country with all manner of roads and highways. It is a fact, however, that some rivers always carried more material than others. The earliest explorers looked at the turbid Missouri and labeled it the "Big Muddy"—a familiar nickname to people in the valley. The Colorado was dubbed by the Spaniards the "colored" or "red river," and the Rio Puerco in New Mexico the "dirty river." The appellations were well deserved, for the middle and lower reaches of all these streams flow through a picturesque but erodible countryside marked by sparse plant growth.

In contrast to such discolored western streams, the earliest settlers found the rivers of the East remarkably clear and crystalline. Such were the rivers draining the Blue Ridge and Piedmont, like the Santee that empties into the sea above Charleston, South Carolina, the James and Rappahannock in Virginia, and the Chattahoochee in Georgia. Today, however, many of these once pellucid rivers are discolored after every rainstorm and carry proportionately as much muck washed off eroding lands as the traditional "big muddies."

The fact that one stream bears relatively more sediment than another suggests differences in climate, physiography, soils, plant cover and land use.

The extremely low sediment discharge of the St. Lawrence reflects a rather healthy watershed with porous soils and plant cover favorable to maintaining the stability of soils and stream banks. Also, whatever silt is produced, particularly on the upper St. Lawrence, is caught and trapped on the shores and bottoms of the Great Lakes and thousands of small lakes throughout the drainage basin, and so never reaches its mouth.

Enormous contrasts in sediment flow are observed in parts of the

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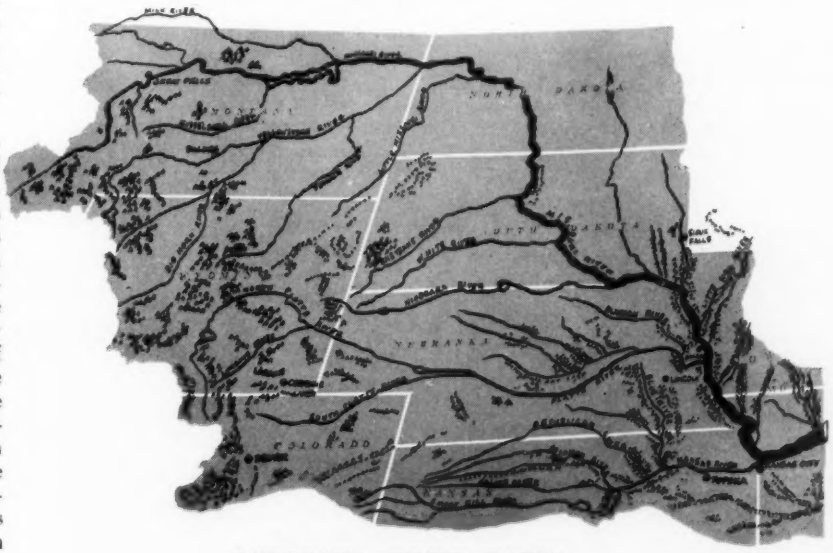
The Missouri River basin comprises about one-sixth of the nation's area



MISSOURI RIVER BASIN

As Industry Sees the Forest S

IS THERE sufficient timber, now, to meet a national emergency, such as another war? Will there be sufficient timber in the future to meet the nation's normal requirements or will America be faced with a timber famine?

To these questions, asked repeatedly by forest industries, conservationists, and public officials, there exists no simple method of deriving an answer. Many have been given—generally characterized by negative conclusions and based on inadequate information. For generations, public agencies have issued statements on national, state, and regional timber supply. But not until the nationwide Forest Survey which began in the early thirties and is still continuing, did a semblance of scientific method, based upon actual field sampling, become important in determining America's timber supply.

Today, the most current and complete source of forest information is the U. S. Forest Service Reappraisal of 1945. This includes data from sample surveys of forest resources in some states and general estimates for many states not yet covered by adequate sampling.

The conclusions of this latest forest inventory clearly indicate that the United States today has sufficient timber, in all major classifications, to meet the demands of another sudden emergency. A recent check of associations of lumber manufacturers throughout the United States substantiates this statement. In most instances, the lumber industry has the plant capacity and sufficient accessible timber to produce for another war on the same scale of production as in World War II.

Since the answer to the question of capacity and available supply is immediate, it must be derived from the present inventory of standing timber. On the 461 million acres of commercial forest land, there is an estimated one trillion, 601 billion board feet of sawtimber. In trees of all sizes (over five inches in diameter) there are 470 billion cubic feet.

This statement is a digest of the bulletin "America's Forest Resources" issued recently by the National Lumber Manufacturers Association. Prepared and released by its Committee on Forest Conservation, it is highly significant both as an interpretation of our postwar forest situation and as reflecting the conservation policy of the lumber industry.

The 1944 sawtimber consumption —plus estimated losses from fire, insects and disease—amounted to fifty-four billion board feet a year. Thus, the existing sawtimber supply is approximately thirty times the yearly drain on the timber inventory.

Moreover, the distribution of this timber within the various regions is such that emergency utilization could be readily undertaken, assuming sufficiency of labor, machinery, equipment and other essentials.

Supply is adequate to meet another emergency, but not without some net depletion of forest capital. War necessitates speed and waste. In an emergency, many uneconomic uses of wood are to be expected. In some areas serious disruption of the orderly progress of forest management might result. Resort to the utilization of growing stock in some areas and excessive depletion of certain species might be necessary.

This emphasizes a factor which must be taken into account in the event of another emergency. Federally-owned commercial sawtimber comprises about forty percent of the total supply. During World War II, this forty percent contributed trees for not more than ten percent of the nation's wood requirements. The sixty percent of the nation's timber which is privately-owned produced approximately ninety percent of the staggering quantity of lumber consumed by the war machines.

Acknowledging that considerable federal timber was located in remote, inaccessible areas, privately-owned timber still furnished more than a proportionate share of the war demand for wood products. In another emergency, means should be developed to provide a more equitable basis for apportionment of the burden.

In an immediate emergency, it would be necessary to deal with immediate factors—that of the standing timber inventory. To properly assess these resources from the long view, the factor of rate of growth must be added to current inventory.

This changes the complexion of the balance sheet. Now it tells a very different story. While there was an estimated sawtimber drain of fifty-four billion board feet in 1944 (includes trees large enough for sawlogs in accordance with the practice of the region, regardless of the actual use on commercial forest land), there was an estimated growth to sawtimber size of thirty-five billion board feet. On that basis, the deficit in that war year of abnormal demand amounted to approximately nineteen billion feet. Assuming no change in these consumption and growth figures, there is sufficient standing sawtimber today to last until about 2033 A. D. Actually, it is known that as the result of increased fire protection, better disease and insect control, and more widespread adherence to sound forestry practices, the rate of timber growth to sawtimber size is being accelerated each year.

Looking at the forests in another light, counting trees of all sizes (in lieu of just sawtimber sizes as above) it is found that in 1944 there was a yearly drain of 13,661 million cubic feet and a yearly growth of 13,370 million cubic feet. The yearly deficit then amounts to 291 million cubic feet. Assuming no change in these latest estimates, there is sufficient standing timber of all types to last until 3560 A. D.

t Situation

This is the bookkeeping picture, based upon the best information today. The computations are set forth solely for the purpose of pointing out that—in the long view as in the short view—America is not faced with a "timber famine" today, nor in the foreseeable future.

To assume ultimate depletion one would be obliged to ignore many obvious trends. He would ignore the fact that every year our forest land is growing appreciably more timber than the year before. He would ignore the progressive transition from static old-growth forests to rapidly growing young forests. He would ignore the progress that is continually being made in controlling fires, insects, and disease. He would ignore technological advancements. He would ignore the progress in American forest management.

The forest industries, with an investment of more than $10,000,000,000 at stake, believe these factors have a proper place in any estimate of the nation's forest future.

Beginning with the Capper Report, which covered the period from 1909 to 1918, every federal appraisal of the forests records an increase in total growth, and in growth of trees attaining sawtimber size, as follows:

(Readers should keep in mind that these tables while showing increased growth also reflect results of better statistical methods in more recent surveys—Editor.)

TOTAL GROWTH
(Million Cubic Feet)

1908-18	5,995
1930	8,912
1936	11,287
1944	13,370

SAWTIMBER GROWTH
(Million Board Feet)

1909-18	9,672
1930	11,731
1936	32,033
1944	35,301

These tables show that total growth in 1944 is reported as more than twice the growth of all timber in the period 1909-18. Measuring sawtimber alone, the increase is three and a half times that of the 1909-18 period. It seems obvious that growth is accelerating much faster than drain

Photo by Al Arnst

Above is how the Wolf Point, Mt. St. Helens Tree Farm, Longview, Washington, looked in 1940 immediately after logging and slash burning. Below is how the same area appeared in 1948. Trees will grow if protected from fire and disease

(which actually has decreased), and that a continuance of this long-established tendency will soon see a steady year to year increase in the country's forest resources.

The relation of timber growth to consumption tends toward balance in all categories. In fact, for timber of all sizes, it is now likely that the nation shows a credit balance, rather than a deficit. The ratios or consumption to growth, as reported in the various federal surveys are:

ALL TIMBER

1909-18:	Drain 4.34 times growth
1930:	Drain 1.83 times growth
1936:	Drain 1.19 times growth
1944:	Drain 1.02 times growth

SAWTIMBER

1909-18:	Drain 5.8 times growth
1930:	Drain 5.1 times growth
1936:	Drain 1.49 times growth
1944:	Drain 1.53 times growth

The increased destruction of standing timber by insects and disease, added to the abnormal demand for wood products during the war years, are the reasons for the increase in the ratio of drain to growth of sawtimber in 1944. The real problem facing the nation's forests is not the amount of timber consumed or grown, but the challenge of destruction by fire and disease.

During the nearly twenty-five years since the adoption of the principle of cooperation among states, federal government and private owners (Clarke-McNary Act), substantial progress has been made in the war against fire. In the entire forest area of the nation, (non-commercial as well as commercial), 544 million acres are now under organized protection. As a result, large areas of land which were "clear-cut" have again produced valuable stands of prized pine and fir. Regarded by many as "cut-out," hardwood stands of the North, having received ten or twenty years' forest protection, are again producing timber.

But more than 111 million acres continue without such a program. These unprotected areas annually sustain by far the heaviest proportional fire losses. Much remains to be done in improving methods of preventing, detecting, and suppressing fire.

Fire losses have lessened substantially and are expected to decline still more. In 1930, fifty-two million acres were burned—in 1947, twenty-three million. In the period 1909-18, the annual timber loss from fire was more than 1,100 million cubic feet. The 1945 report placed fire losses at 460 million cubic feet, far more than the total yearly timber deficit.

Greater acreage under protection plus improvement in control techniques are not the only reasons for the improving fire record. Under the Clarke-McNary Act, an effective fire prevention educational campaign is being conducted. Under the leadership of the wood-using industries, a "Keep America Green" program has been initiated in twenty-four states, helping to create a sense of public responsibility for fire prevention as well as a realization of the importance of the forest resources of the country.

While the necessity of fire control has long been recognized, and concerted and cooperative efforts have been made to combat the hazard, no such coordinated attack on the insect and disease problem was undertaken until passage of the Forest Pest Control Bill in 1947. Today, state, federal and private agencies are beginning to combat this menace. During the 1909-18 period, insects and disease were exacting a toll of approximately 600 million cubic feet of wood each year. In 1945, this annual loss had grown to more than a billion cubic feet, more than double the current loss from fire. This demonstrates that control of destructive forest insects and disease is now a major problem.

Coordination of the efforts of public and private agencies, combined with the use of new materials and techniques should, during the next decade, speed the solving of this problem. Heaviest losses from this cause are in old-growth forests. Selected cutting of the old trees from these areas would result in new growth which is not so susceptible to injury from insects and disease, thereby helping to eliminate this number one hazard to the nation's forests.

Use of scientific methods in combatting natural enemies of trees are helping in the rapid development of scientific forest management. Twenty-five years ago it is unlikely that more than twenty companies, engaged in either pulp or lumber manufacture, planned for permanent operation through the practice of forestry management. The combined acreage under such a program was less than two million. Today, at least eighty million acres of privately-owned forest land are under forest management programs. This is indicative of the outstanding progress made in industrial forestry within one generation.

Such progress is further indicated by the increasing number of professional foresters employed by industry. In 1930, forest industries employed less than 400 foresters. Today they employ 2500.

Through their initiation of the American Tree Farm Program, these industries have committed themselves to a policy of constantly improving forest management. Although started as recently as 1941, twenty-three states with more than seventeen mil-

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MY FAVORITE TREE

Lauritz Melchior

World's Greatest Heroic Tenor

The Danish Beech, that is the tree I like best, because when the first leaves come out in the spring, this tree is the most delightful and beautiful sight one can imagine. The tree is tall, the leaves a glorious shade of green and underneath always grow spring flowers, for the tree allows the air and sun to come through its branches. During my earliest youth, we would know when we saw the first leaves beginning to appear on the Beech that summer really had come.

There always is an air of romance about the tree for it is the custom in Denmark for sweethearts to walk together through the Beech tree forests.

POSTING
is not enough

By EDWIN F. STEFFEK

Fish and game for your land is no problem if you provide adequate shelter and food. And you can do the job yourself

Posting land — preventing others from hunting or fishing—is not conservation. Conservation is bigger than that, something in which all of us—conservationist, sportsman and landowner alike — can take part. Great sums of money are being spent on restocking certain areas. Too often before liberated fish or game has had time to get remotely acquainted with its surroundings, it finds its way into some sportman's bag or creel. Neither is that the answer. To restore fish and game we must take active steps to restore the food supply and the surroundings they need. Then, and only then, will our other efforts bear fruit.

It is not enough to depend upon the federal government and the various state agencies to bear the burden. It is for us, the citizens, to do our part as well.

During periods of deep snow, feeding stations are a great help to game birds, but a more lasting scheme would be to encourage small game by providing it with natural foods and shelter. In our zealousness to do a good job of farming we clean out all the small trees, bushes and other growth along our fences or stone walls and corners where we can neither plow nor plant. In many ways this is harmful for, by so doing, we clean out the refuges of both song and game birds that do so much to keep insect pests down.

A few hackberry trees, sumacs, mountain ash, buckthorns and dogwoods as well as bittersweet vines, huckleberries, wild grapes, Virginia creepers, hazelnuts and blackberry or raspberry tangles will offer much in the line of food and shelter, as well as protection from natural enemies, for small game without interfering with our farming to any extent. Likewise, a little millet or oats scattered in out-of-the-way corners and left to grow will do much to encourage wildlife.

Turning to the game itself, such hedgerows encourage the bobwhite which eats tremendous quantities of harmful insects as well as the seeds of such pests as fox-tail and witch grasses, bindweed and corn cockle. The bobwhite is also attracted by the seeds of pine trees, acorns, beechnuts, bayberries, wild grapes, sassafras and mulberries, none of which interfere with farming to any great extent. Why not give him a hand?

The wary ruffed grouse, especially, appreciates such cover and multiplies accordingly. This, too, is of especial interest to the conservationist, since the grouse will rarely venture far from cover but is a great consumer of harmful insects and weeds as well as its normal wild food. The spruce grouse, of course, is more a creature of the northern woods and is not so much concerned with such methods.

The pheasant, on the other hand, is not so wary as the ruffed grouse but it, too, appreciates any assistance we can give it and responds accordingly. It also is a gross feeder on insects and pestiferous weeds. Among its wild foods are most of the seeds and fruits already mentioned together with rose hips and a few others like wild mustard and chickweed.

The shy woodcock is a little different. It lives almost entirely upon angleworms and is not affected by such food as we can plant. But it will certainly appreciate any cover we can give it, especially if the latter is in the low moist spots where it feeds.

The mourning dove also appreciates added cover and seems to like, especially, old apple trees for nesting.

Ducks and geese present a different problem. Naturally, they benefit from a little grain in winter if they happen to come around due to a food shortage elsewhere. Both mallards and black ducks will eat many of the seeds and fruits already mentioned as well as their aquatic foods, while the wood duck is largely dependent upon them. Large, deep nesting boxes hung on the tree trunks will also prove very attractive to the wood ducks when present. Here is one way in which we can help and the introduction of aquatic foods, of course, will aid the others.

As for the cottontail and snowshoe rabbits so well-known to all, both will greatly benefit by the added cover. Given a tangle of raspberries or blackberries, the cottontails especially will multiply accordingly—but are hardly likely to become so plentiful by such methods alone as to damage crops seriously.

Our friend the raccoon will enjoy additional cover, particularly if it is near water and will take advantage of such fruits as we allow to remain or restore. Wild grapes, in particular, are among his favorites,

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Mt. Hood

By JAMES N. WALLACE

Practically on the doorstep of Portland, this snow-capped Oregon mountain and surrounding forest provide a year-round playground

Two hikers unshouldered their packs for a moment's rest on a green-mantled Cascade slope. While they relaxed they caught sight of a pack train winding its way up the trail ahead, and below a fisherman played a fly across a bounding trout stream. "Anything the heart desires," one of the hikers mused.

His companion did not answer right away. He had raised binoculars to his eyes and was studying ten flyspecks on the face of a mountain peak to the north—mountain climbers working their way up the face of Mt. Hood. Finally lowering his glasses, he passed them over. "Yep, anything," he replied with a satisfied grin on his face. "Here, take a look."

Farther back, where they had turned off the main trail, they had stopped to chat with a family group camping in the deep woods. Before that, near the highway, had been picnickers and automobile campers. Indeed, whatever form of woodland recreation and sport the citizens of western Oregon desired could be found here in the Mt. Hood National Forest just seventy miles from Portland.

One of the nation's most varied woodland playgrounds, the area is

dominated by rugged, snow-capped Mt. Hood, 11,245 feet above sea level. And not only is it a handy mecca for the people of Portland, but near Highway 30, the main north-south route on the Pacific Coast, the forest attracts many vacationists from Seattle, 200 miles to the north, and from San Francisco 600 miles to the south.

More than that, the calendar makes little difference to Mt. Hood forest visitors. As many come in January as in June. By next January, of course, hikers will have traded boots for skis and campers will have put aside mosquito netting for down-lined sleeping

bags. But there'll be just as many people playing in the Mt. Hood area.

Skiers, who first made the Mt. Hood recreation area famous, begin coming in by the thousands in November. Novice or expert, they all head first for the same place—Timberline Lodge. Built by the government in the WPA era when cost was no object, the massive lodge clings to the snow-hidden slopes of the great mountain above a primitive forest—a ski lodge as lavish as a continental hotel.

Almost within a ski pole's reach of the log and stone lodge are gentle slopes for the beginner as well as trails for the expert and dizzy canyons for the daredevil. Olympic teams practice on Mt. Hood, for its slopes are much like European ski areas.

The "Magic Mile" is the mountain's most popular ski run. All above timberline, it is steep enough to test the nerve of anyone who "schusses" straight down. But it is wide enough for the less expert to traverse the slope at his or her own speed. A chair lift takes skiers to the top of the "Magic Mile," and on winter Sundays the waiting line curls out through the snow.

The national forest offers year-round skiing to anyone who doesn't mind shouldering his skis and hiking to the snow fields. Most of the summer skiing is done on the glaciers above Cloud Cap Inn, on the northeast corner of the mountain.

Cloud Cap was the first part of the Mt. Hood region to be developed. It used to be a show place for Oregon visitors, but since the fabulous Timberline was built Cloud Cap has been relegated mainly to mountain climbers and summer skiers.

During the warmer months hikers have their choice of trails — and every trail in the fir and hemlock forest that surrounds Mt. Hood is well worth traveling. The area near Highway 50, which cuts through the heart of Mt. Hood National Forest, is honeycombed with trails. Some are wide and well-marked, others are indistinct pathways winding through the trees and along mountain streams.

Many of the blazed trails are a holdover from the years just after 1900 when every Portland banker with a few extra dollars had visions of a trans-mountain railway. Countless surveys were made, some right-of-ways were acquired, but that's as far as it went.

These trails began to revert to nature when the survey crews moved out, but they gave Civilian Conservation Corps men a starting place when they were remarked thirty years later. It was in the decade follow-

Mt. Hood's rhododendrons are at their best during the warming June days when summer first comes to the uplands

ing 1933 that most of the Mt. Hood forest recreation area development and improvement was done.

Some of these trails are more than a century old. One, the old Barlow Trail, had a major role in Northwest pioneering. What was once a main route for wagon trains coming into Oregon is now a bridle path that twists along the Salmon River south of Mt. Hood.

Most popular is Skyline Trail, a 190-mile mountain pathway along the ridgepole of the Cascades from Mt. Hood to Crater Lake. Thousands of outdoorsmen hike part of the distance every summer, and a surprising number make the entire trip. And every summer weekend sees pack trains starting from Mt. Hood or Crater Lake. When the saddle-hardened vacationists dismount three weeks later, they've been through one of America's great wilderness areas.

In winter, parts of the Skyline Trail are used by skiers for cross-country racing.

All of this trail area, and the roadways leading into it, are well-marked. Most of the signboards, however have an unkept look. This isn't Forest Service inefficiency. It's bears. It seems that bears love to chew on wooden signboards, and as yet nobody has come up with a bear-proof board.

A Portland camper once said that his idea of Heaven would be a campsite in the Mt. Hood forest. His enthusiasm is well-founded, for there's a campsite to suit every taste in this 1,100,000-acre playground.

For Sunday afternoon picnickers, there are improved areas with cook stoves, log tables and piped springs —all near the highway. Other locations, for those who want to get farther into the woodland are reached over fire-trail roads.

But the best campsites, in the eyes of the confirmed outdoorsman at least, are those in the isolated upland meadows. In these areas you rough it, from necessity as well as choice. They are reached only on foot or by pack train—but more than 2500 northwesterners vacation there each summer. The Forest Service has tested the water in most areas, marking springs that are unsafe, but otherwise the backwoods camper is on his own.

The hiker who tires of wooded trails can pull on a pair of calked boots and head for Mt. Hood's summit. Here again is variety to suit every demand. There are summit trails on the south slope that can be climbed by almost anyone with average physical ability. Just around the shoulder of the mountain are routes that test the nerve and skill of seasoned Alpine climbers. The thrill of "getting to the top to see what's on the other side" is one of Mt. Hood's great drawing cards. It is perhaps the most climbed mountain in America. Good roads which take you right to the starting point of the summit routes explain in part why

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Chips on the Land

Tree tops and limbs left from logging or thinning need no longer plague woodland owners. A new portable machine grinds them into chips for about $2 a ton for mulching and soil improvement

By ROBERT A. SCHRACK and L. RUSSELL ALBRIGHT

IT could be that farm foresters can now delve into that "pot of gold" they have been seeking these many years. Owners of farm woodland will readily spend more time and effort to improve their timber stands if they can be convinced they will be well paid for their trouble. A newly developed portable wood-chipping machine shows promise of providing the "clincher."

Until recently farmers had to be converted to woodlot management chiefly on the strength of profits which could be obtained from occasional sales of logs, poles, or pulpwood. Too often the farmer weighed his modest profit against the problem of disposing of the tree tops and branches which cluttered his woods after logging, thinning, or pruning. Such debris hindered putting his land back into productivity. Furthermore, it created a fire hazard.

Wood chips as a mulch for strawberry beds have proved highly satisfactory at the Rhode Island Agricultural Experiment Station

But suppose the farmer could convert those pesky tree tops and branches into wood chips which would enrich the soil of his land, mulch his strawberries, or perform countless other useful functions around his farm? Naturally he would perk up and listen. Just such an economical and practical solution is offered by a portable wood-chipper developed at Fitchburg, Massachusetts.

It is fascinating to contemplate the actual and potential uses of wood chips. Arthur C. McIntyre, chief of the Northeast Region Forestry Division of the Soil Conservation Service, will tell you he has seen several cases of excellent farm crops being grown on soils that have been heavily treated with wood. Research has disproved the old wives' tale that "wood makes soil turn sour."

On the contrary, wood is organic matter in its cheapest form. In addi-

A wood chipper at work chewing up a brush pile

tion, it is a longer lasting form than that produced by the usual green manure and cover crops of soybeans and rye. Organic matter, as it breaks down after having been applied to the soil, produces humus. A high humus content is one of the essentials of good crop soils. It makes heavy soils more porous and easy to work—aids soil aeration and root penetration.

It improves physical structure and increases production, and enhances the water-holding capacity of light soils. A high humus content is one of the best aids in the control of soil erosion by wind or water. Thus it is easy to understand why every farmer is continually concerned about it.

The suggestion has been made that the farmer might produce chips from waste material in his woodland and apply them directly to his fields. It is more logical to assume, however, that the chips will find their way to the soil by an intermediate use. There is a continual demand for sawdust, shavings and small chips produced from mill waste. The farmer needs such material in his dairy barn, his poultry house and as mulch for his strawberry bed. There is always a steady pressure of demand against available supply.

What's more, these chips can be produced economically with the new wood-chipping machine. Studies made of operations on the Scituate watershed near Providence, Rhode Island, show that a ton of wood in branch or bolt form can be turned into chips at a cost of about two dollars. This puts chips on a competitive basis with other sources of organic matter used by the farmer.

Straw, for example, sells for more than $15 a ton. Sawmill operators have no difficulty selling sawdust for $3.25 a ton, and some report prices as high as $5. Farmers will drive their own trucks considerable distances to planing mills to buy shavings at about $7 a ton.

In New England, sawdust, shavings and straw are in demand around dairy barns because of their ability to absorb moisture. Chips would be equally effective, even serve the same purpose in poultry houses. The Rhode Island Agricultural Experiment Station, in fact, has planned chip trials for both dairy barn and poultry house. Dr. Vladimir Shutak, encouraged by favorable results of mulching strawberries with chips last year, plans to expand his trials this year to include blueberries and orchards.

The use of wood as a mulch is not new. James G. Chadbourne of North Bridgeton, Maine, has been using sawdust for thirty years. Home gardeners have also reported equal success, citing more uniform soil temperatures, better retention of soil moisture and reduced cost of weed control. Commercial nurseries may find it valuable to replenish organic matter lost when topsoil is depleted through sale of balled ornamental stock.

Chips as a source of compost material should also interest the organic gardener. There is every possibility that composting will reduce the nitrogen deficiency which must be corrected whenever the woody material is applied to the soil. The population of micro-organisms in the soil increases rapidly as organic matter decomposes. This process ties up otherwise available nitrogen which must therefore be increased by additional applications during decomposition. This should be kept in mind when chips are used as a source of organic matter.

For dramatic proof of the workability of the wood-chipping machine on large scale operations, one might visit the Scituate watershed area of some 14,000 acres owned by the city of Providence, Rhode Island, and managed by the city Water Supply Board. There a chipping unit has been in use since late 1946. The machine is small and compact. Although it is of heavy duty construction, it is so highly portable that it can be towed along the highway at a speed of thirty-five miles an hour.

Complete with power unit, it is only four feet wide and eight feet long, and its ton and one-half weight is so well balanced on pneumatic tires that two men can easily unhitch it from the jeep which tows it and maneuver it into position for use. A sixty-horsepower gasoline engine is mounted on the front of the semi-trailer. The chipping unit itself is in the rear, and consists of a heavy fly wheel with four cutting knives bolted to it. The chipping wheel, op-

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No unsightly nuisance or hazard of woods debris mars this North Scituate, Rhode Island, Reservoir plantation after thinning and pruning. Instead, wood chips cover the forest floor and help enrich the soil for faster tree growth

A. F. Hallowell

Youth Hostels in Sweden

By ROBSON BLACK

Thousands of young Swedes are taking advantage of the 300 "ramblers' homes" established by the national Touring Club to encourage outdoor recreation. "Good Manners in Nature" has become their covenant

In Sweden, they speak of them as ramblers' homes. In America, we call them youth hostels. With almost forty years head-start, the Swedish Touring Club, organizer and guardian of the national movement, has 300 hostels in operation and, last year, provided 230 thousand nights' lodgings at a cost to the rambler of about twenty-five cents each.

In these days of extreme building costs, it goes without saying that no club could set up 300 hostels and rent accommodations at a tenth the rate of the cheapest hotel. What happens is the national sponsor of the hostels accumulates a large annual revenue from its 170 thousand members, as well as from publication work, and thereby cushions the daily losses on operations in the field.

Club directors rarely build a new hostel, preferring to rehabilitate an old farmhouse, or make a rental contract on an advantageous property. They also have taken over historic castles and manor houses, capable of sleeping as many as 200 people. Recently, they acquired a tannery of early eighteenth century type, installed electric stoves, partitioned off rooms and dormitories with running water, and provided kitchen facilities whereby guests prepare the food they bring with them. Last year, the Swedish Touring Club acquired a warehouse dating from 1250, gave it a coat of paint and furnished attractive accommodations for 100 visitors.

In the main, the Swedish hostels, or ramblers' homes, are established in the heart of nature and with access to lakes and rivers. This is quite easy in a land dotted with 96,000 lakes within its thousand-mile length. At first glance, one might regard the Swedish plan as merely furnishing inexpensive lodging for any casual itinerant, but only those with paid-up memberships in the Touring Club are provided for. The dominant purpose is to encourage the young people of Sweden to spend their weekends and longer vacations in the healthful environment of woods and waters. You will see few motor cars racing from hostel to hostel. Cars are woefully expensive in Sweden and a hosteling group would feel foolish in even the most bedraggled jitney. Either you pedal your bike or you tramp afoot, and if you think you are going to hitch-hike a round of hostels it is wiser to remain at home.

The Touring Club goes all out for a system of cheap travel that requires boys and girls to work their way from place to place, prepare their own food, wash dishes, and leave their quarters immaculate for the next arrival. In fact, the club goes a step

beyond that. It has a popular slogan, long since taken to heart and applied to conduct by most of the lads and lasses tramping or cycling the trails. In English, the slogan reads, "Good manners in Nature," and it has become a covenant of Swedish youth.

Under its inspiration, a company of lads fishing a stream take only a very few trophies, perhaps enough for their next meal. A meadow ablaze with wildflowers must not be cleaned out but left substantially as the traveler found it. Orchards must be left alone, unless the owner chooses to give the youngsters a handout. No campfires may be set anywhere near a woodland or grain field. All these things, of course, are written down in the annual membership pledge but, more important, they have grown into an accepted code between any hosteler and his pal.

"Learn to know thy country" is also a slogan of the hostelers, and this has a purpose with uncommon appeal to America. The Swedes are a race-conscious people, almost wholly of the Lutheran faith, and with a firm pride in their long history. Anxious to rid themselves of any tight little provincialisms and sectional prejudices, they are trying through a constant interchange of youth to bind all provinces together in mutual knowledge and sympathy. This gives a serious cultural aim to the Swedish venture.

The natural barriers of distance in America present a far stiffer problem in mixing Idaho and New Hampshire groups, or Oregon with Georgia. One would hardly ask a company of Lake States youngsters to push bicycles to Oklahoma, much less do the route on shoe leather. And, as matters stand in America, there are few hostels along any route and few cycling paths free from roaring motors.

Up to a few years ago, the Swedish Touring Club shouldered the whole burden of financing losses on its 300 hostels. Then came a lucky break. The government took over the football pools and ran them as a state enterprise, absorbing the handsome profits. From this windfall, the Touring Club is given substantial grants to equip hostels, usually by making over old properties. As its reputation spread, the club began to be offered buildings held by municipalities or by other public authorities. One of the most recent and dramatic philanthropies to come its way was the transfer of a picturesque old sailing ship now moored permanently to a dock in the very heart of Stockholm. It is perhaps the most unusual and interesting "hostel" to be found anywhere in the world as I had good reason to learn in a long examination of its interior.

The ship, the *AfChapman*, is a steel-hulled sailer, built in Britain over sixty years ago for the grain-carrying trade from Australia, and finally passed to Swedish ownership. Two hundred and forty feet in length, with beautiful yacht-like lines, she will never again dip to an ocean swell, for the "economics" of modern shipping have put her out of the running. Venturesome and imaginative, the Swedish Touring Club took over the ship on long loan and has a swarm of carpenters, plumbers and painters now putting the finishing touches on its new floating hostel. Along about mid-summer rooms will be ready for 138 persons, each paying just a quarter a night.

Unlike the country hostels, a restaurant and snack bar are provided on an upper deck. Each room is well heated and air-conditioned, with run-

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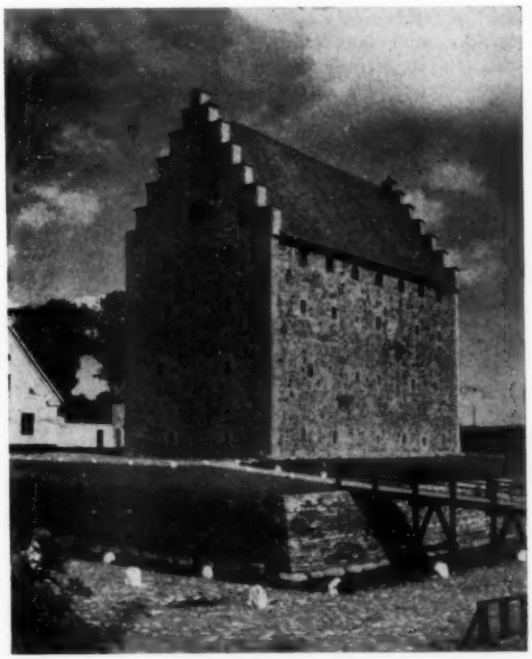
This 60-year-old sailing ship, moored permanently to a dock in Stockholm, makes a picturesque hostel



Numerous old castles and manor houses have been acquired by the Club. This one will accommodate 200

Photo by Overstiggt

In California, Jeffrey pine seeds are obtained by knocking the dried cones together

LAST November, the voters of Oregon approved a proposal to enlist the state's credit for borrowing up to $550,000, through issuance of bonds, to restore timber trees on the vast eyesore known as the Tillamook Burn. Tentative plans call for seeding or planting 20,000 acres a year for fifteen years.

This is but one indication that America at last is waking up to the need of reforesting the best of its denuded and idle lands. Another is that state foresters estimate forest nurseries under their direction will increase production of planting stock more than 100 percent in 1949. This is because demand for young trees to plant on lands in private ownership is reaching unprecedented heights.

Lee Prater

White pine seed mixed with sawdust is used for aerial re-seeding experiment

This awakening, unfortunately, does not mean that we are launched upon a major national tree planting effort. Even if the 370 million young trees state nurseries might produce this year are put in the ground, they will restock less than 500 thousand acres of farm and other small forest properties, a fraction of the one to two million acres we should be planting yearly under a realistic program (see "Planting America" in the March issue). But as a trend it is both encouraging and a challenge.

Much has been written in recent months on the financial and technical aspects of carrying forward an adequate reforestation program. Opinion in general is that we have the technical know-how and that funds with which to finance planting will be made available when there is a will to plant—a compelling desire for new forests.

But little has been said about a third basic requirement for large-scale planting projects—seed. Tree nursery development to meet an expanded planting program can progress only to the extent seeds in the species required are available. And in view of the fact that seed shortage is one of the reasons frequently given for limited nursery output, the problem of seed supply might well become the key to achieving our planting goals.

What, then, is our situation with regard to seed?

In terms of conifers, which are the species usually employed in carrying out large-scale planting programs, the United States may be roughly divided into five general regions: Northeast, including the Lake States, South, Rocky Mountains, Pacific Northwest and California. Several important commercial tree species are common throughout each of these geographical areas, which means that such species may be safely planted almost anywhere that soil conditions permit within a region. Furthermore, it means that seed sources are widely distributed.

This last is hugely important, since local crop failures in the larger regions, such as the South and Northwest, may not indicate that the overall seed supply is limited or poor in quality. In the smaller regions, however, local seed crop failures frequently spell short crops everywhere, as witness Douglasfir in the Pacific Northwest and coast redwood in California for the past two seasons.

As to hardwoods, such trees as basswood and white ash, tulip tree and southern red oak are noted for their special use values and for the fact that, under reasonably good growing conditions, they put on wood at rates which compare favorably with the better conifers.

In the western states there is a dearth of hardwoods, although such trees as red alder and the poplars enjoy a large demand at present and

Where Will We Get Our Seed?

By JOHN B. WOODS

If and when we tackle our huge tree planting job, can we supply the quarter million pounds of seed that will be required every year? Here is an interesting answer

will continue to do so if supplies are made available on a sustained basis for local industries. In the East there is the fear that all suitable soils will come eventually under hardwoods through the gradual crowding out of conifers, a consummation which appears to be expedited by better farming practices and fire protection. Thus, since hardwoods can be reproduced easily by sprouting as well as direct seeding, little has been done to regenerate them artificially. Yet in any nationwide reforestation program hardwoods necessarily will figure at least in a small way, if for no other reason than that they regenerate so readily.

However, conifers are most urgently desired and therein lies the chief seed supply problem. If the output of nursery stock is to be increased several fold, as is expected, seed supplies must be multiplied accordingly. Since seeds are bought and sold by weight and since the number of germs varies according to species from less than 10,000 to more than 500,000 in a pound, close estimation of nationwide seed requirements is impossible.

Nevertheless if one assumes that nursery stock will be needed for planting a billion southern pines, it probably is a fair guess that 75,000 to 125,000 pounds of seed will be needed, the margin allowing for varying quantities of the four chief southern pine species and for other uncertainties. In the North and far West, where most trees produce small seeds, the quantity required to replant a million acres via the nursery probably would range between 35,000 and 75,000 pounds. Altogether, then, 110,000 to 200,000 pounds might be needed yearly for the nation's nurseries.

It may be found possible to reforest a considerable portion of the denuded acreage by direct seeding, in which case different quantities of seed are indicated. Foresters know that nature is prodigal when she sets about regeneration of woodlands, scattering several pounds of seed upon each acre. Until recently man has felt impelled to do likewise, which sometimes made the costs of direct seeding run to more than those of growing and outplanting nursery stock. Now, however, the use of seeding tools and particularly the helicopter enables the forester to obtain satisfactory restocking with less

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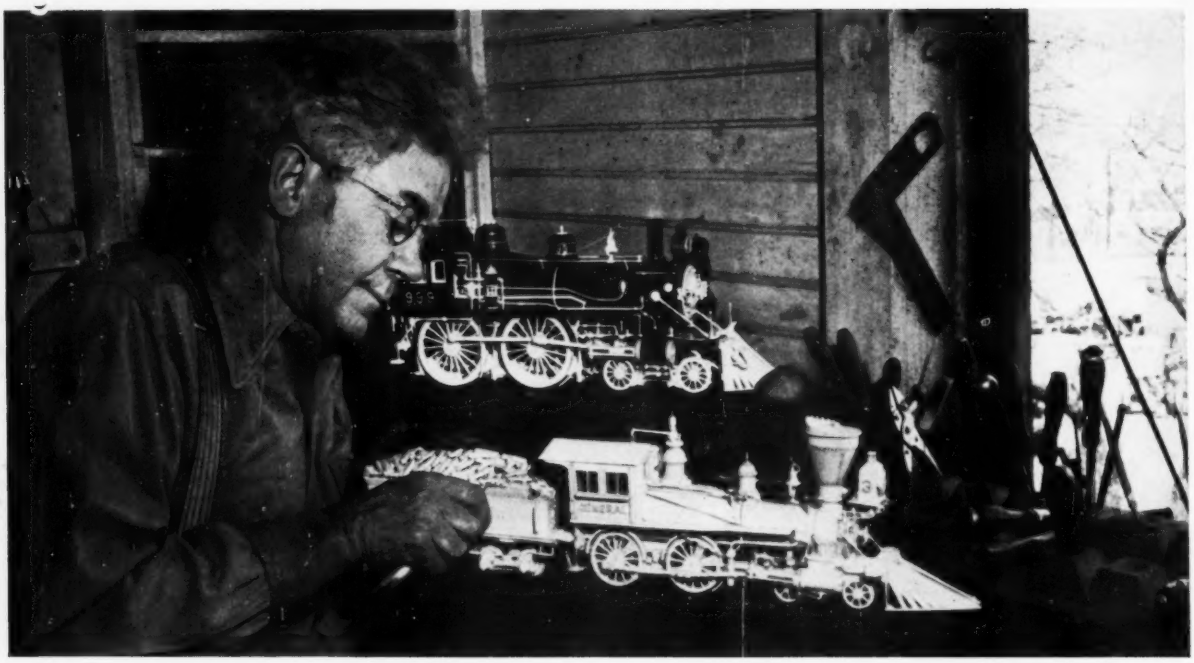
Recently transplanted two-year-old white spruce at a Michigan nursery



"That Whittling Warther Boy"

By LLOYD F. LENZ

At the age of five, Ohio's Ernest Warther found a jackknife—and he's been carving ever since. Today his models are world famous

The world's greatest carver. That's how Ohioans refer to Ernest Warther, native son of Tuscarawas County. This man, who looks like an orchestra conductor, is a genius with a knife. He has been whittling practically all his life.

Now, in a little building behind his trim home in Dover, he has opened the Warther Museum to show the public what he has been making. The exhibits are mainly miniature locomotives carved out of wood and ivory. There are other marvels, too—such as a model of the steel mill where Carver Warther worked for twenty-one years.

The word "marvels" is used advisedly in talking about these creations. The mountain-type locomotive, for example, is a reproduction of one built in 1930 by the Baldwin Locomotive Works. It has more than 8000 parts and required nearly 1600 carving hours. It is valued at $25,000—but it is not for sale. Nor are any of the models for sale. "My roof does not leak. I have plenty to eat. Why should I sell things that I have been so long making?" asks Warther.

He began carving when he was five years old—ever since the day he found a knife while tending a cow for his widowed mother. The knife was pretty stiff and he had trouble opening it. This was finally accomplished by using his teeth, and he tried it out on a sign tacked to a roadside fence. The sign was of pine, excellent for whittling. When he had whittled it away he found other signs.

Neighbors hired him to herd their cows. He received $1.25 a month for each cow, soon had twelve, and was making what seemed good money. The job gave him lots of time for whittling.

When he was fourteen, Warther went to work in a Tuscarawas County steel mill. But he kept the knife—kept right on whittling. The home he and his wife built is at the end of Karl Street, on the edge of an abrupt hill that overlooks a network of railroad tracks in the valley. Locomotives fascinated Warther, so in 1913 he decided to tell their story by carving scale models.

He started with the first steam engine ever made, the one built in 250 B. C. in Alexandria. It had doors which opened and closed. Another was a model of Cugnot's steam carriage which made its first run in the streets of Paris in 1769, tipped over and was locked up as unsafe. Then there was the replica of the first locomotive to pull a passenger train, the one built by George Stephenson in 1829. Beside it went the first steam engine that pulled cars from a coal mine in South Wales in 1803.

After carving for ten years he had finished fifteen models. The New York Central Railroad heard about him in 1923, and Warther's mill days were over. He and his models were put on a special train and, in six months, the exhibit covered 13,000 miles and attracted 70,000 people. Then Warther went into carving professionally.

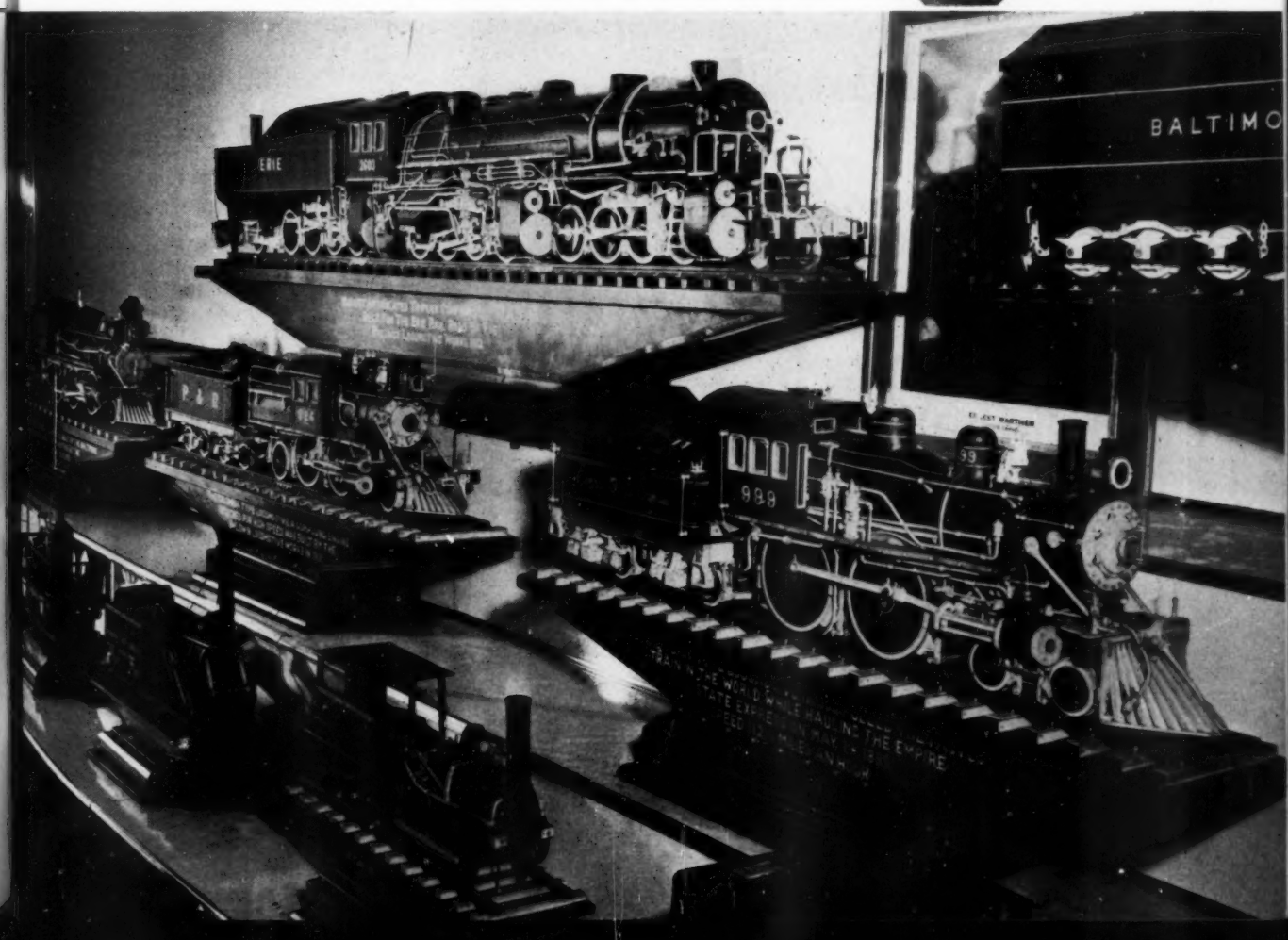
He has traveled a great deal, showing his models and giving informal talks and lectures. As a stunt he often whittles pliers from single sticks of wood. He made one for me in a minute or two. There were no shavings, and the pliers work! It is an amazing trick.

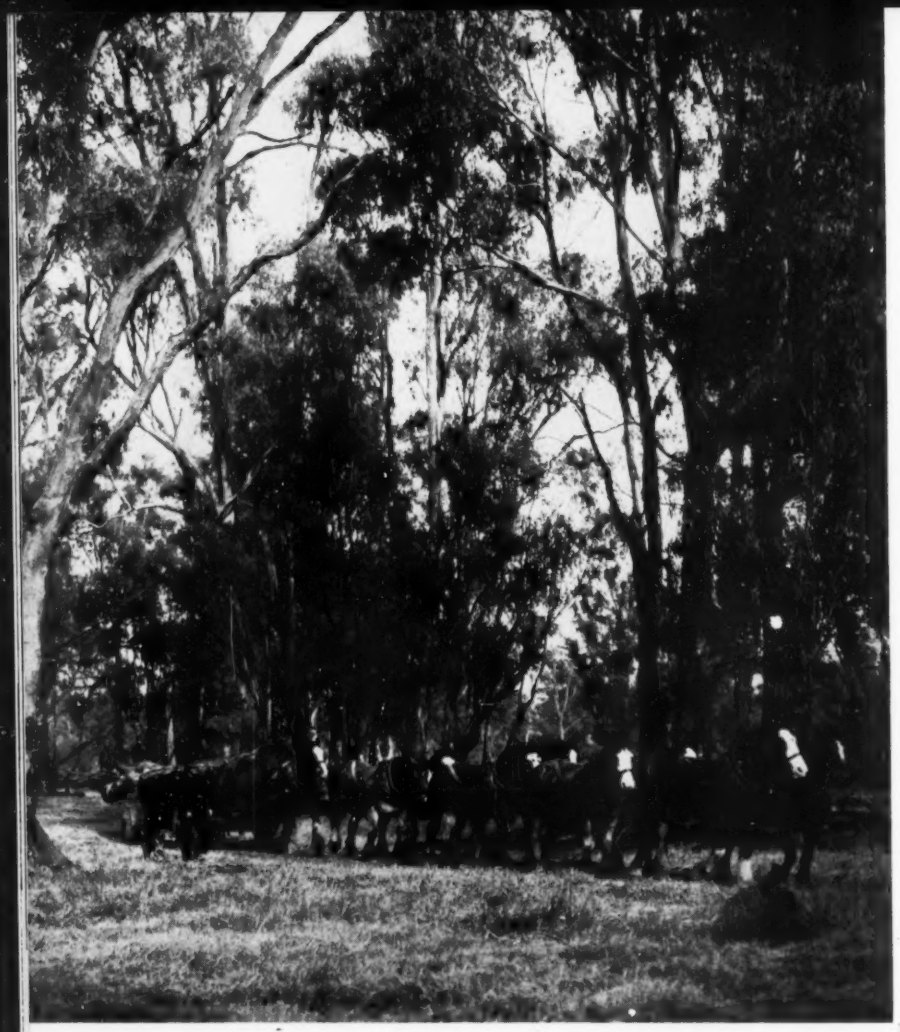
His carving knives are all his own make. During the war he made commando knives exclusively. General Mark Clark got one of them. Warther's son, David, who served on a Navy fighting ship during the war, now makes fine cutlery under his father's direction.

Warther's little workshop is delightful, surrounded by his wife's flower garden in summer, heated by an open fireplace in winter. His chief tools are knives. He uses no lathe. He has quite a few ivory tusks about, for he carves ivory almost as much as wood and uses it on all his models. He imports ebony for his train bearings. All his models are capable of

(*Turn to page* 36)

Some of the engines carved by Warther are housed in a museum behind his home in Dover, Ohio. The model of the famous "999" contains 10,004 parts





Cliff Bottomley

Forests in Ferment

By M. A. HUBERMAN

Conclusion

In this closing chapter, the author voices the hope that United Nations can help the Far East solve its forestry problems. The Philippines, Australia and New Zealand point the way

THE ferment at work in the forests of most Far East countries at the time of my tour of inspection was conspicuously absent in the Philippines, in Australia and in New Zealand. This was evident in many ways, especially in the logging shows and at the sawmills and shipping docks.

At Cebu, where a large wooden cross marks the spot where Magellan, on his round-the-world jaunt, had the first Mass celebrated in the Philippines, in Manila and in numerous other cities repair and reconstruction of bombed and burned buildings provided a hustling, bustling atmosphere such as I had not seen anywhere else in the Orient.

Lumber, of course, was one of the most urgently needed materials. Consequently, the government was doing everything possible to stimulate lumber production. At first, reconstruction needs were met before export demands, but as rebuilding progressed export restrictions were lifted, until now fifty percent of production may be exported.

Problems, as may be expected, were great and I heard most of them reviewed at a dinner meeting of the

Left, picturesque team drags red gum logs to an Australian mill

Aerial view of heavy forests which surround Lake Davao on Leyte Island

Philippine Lumbermen's Association in Manila. Costs of production were too high—the price of lumber too low. Government restrictions on exports were too tight; general government policies were too uncertain—taxes too certain. It made me feel right at home to hear this type of talk.

The meeting resembled similar gatherings in the States in another important respect. After growling publicly in true democratic fashion at all the troubles besetting their industry, the lumbermen responded enthusiastically to appeals by government officials for bigger and better production. And this enthusiasm was not just banquet talk, as I found out on my travels through the Islands. Everywhere former U. S. Army sawmills were operating at full speed. Logs were coming out of the woods under arches, behind Army and Navy surplus tractors, and on trucks and trailers. The majority of logging operations still depend on the faithful plodding *caribao* or buffalo, but all were busy.

Many of the loggers and sawmill men grinned as they contrasted the present effort with that of the Japanese during their occupation. I had read this story in *American Forests* ("Forestry Fiasco," by Carlos Sulit, September and October 1946 issues) before seeing the Philippines. But to hear it from the lips of Filipino loggers and sawmillers was a pleasurable experience.

On the Island of Negros I visited logging operations in heavy *lauan* forests, traveling by comfortable speeder over narrow gauge track to see all phases of felling, skidding with tractors and arches, and loading logcars with straddle loaders. Except for the woodworkers this whole logging show could have been in our own Pacific Northwest. In fact, the manager, the logging superintendent and the railroad engineer were all loggers from Oregon, who had come to the Islands long years ago and had fought with the guerrillas against the Japanese.

The logging superintendent was virtual mayor of the logging camptown, with its hospital, school, movie, community center and small but comfortable residences and he was well-liked, especially by the boys and girls whose Scout troops turned out to greet us.

The town, with a population of 18,000, was almost completely dependent on the woods and mill operations of the various lumber companies. These, in turn, depended upon logging concessions on the national forests. When our party arrived the people of the town put on a huge celebration in honor of Florencio Tamesis, director of the Bureau of Forestry. And it was that way on every island we visited, on Cebu, on Panay, on Leyte, on Samar, and especially on Mindanao. Everyone seemed to know the director of forestry was visiting either village or sawmill, and insisted on personally welcoming him and his party. In Butuan, on the Agusan River, he was called upon to judge a beauty contest to select Miss Butuan of 1948.

A steam power plant and hoist for skidding logs help speed operations for busy crews working south of Bitulok on Luzon in the Philippine Islands

This was a sort of triumphal tour for Director Tamesis, since in many instances it was his first opportunity since the liberation to visit these people, many of whom had been with the guerrillas harassing the Japs in the hills. The hospitality accorded him and the widespread interest in his work clearly indicated the people of that country appreciate how closely their livelihood is wrapped up in the forests.

The government also realizes this. It has provided, through a special tax on all logging operations, a fund which makes possible the systematic replanting of cutover forest land. We visited planting projects on the island of Cebu, where past overcutting followed by unwise cultivation on steep slopes was leading to critical erosion. The nursery there was producing seedlings of pine, mahogany, teak, casuarina and other species, most of which were showing good survival and making rapid growth in the plantations.

This, of course, is just one of the activities of the Bureau of Forestry, which is organized along the lines of the U. S. Forest Service. Many of their foresters were trained at forestry schools in this country and were well acquainted with our methods and approach to problems. Most of the bureau's staff, however, had been educated at Los Banos, the Forestry School of the University of the Philippines.

Few of the buildings at Los Banos are still intact, the result of the Japanese destruction. The valuable library and laboratory equipment, along with residences and dormitories, were destroyed by fire. But the faculty is undaunted in its determination to bring the school back up to its high pre-war standard. Before the war many of the professors at the school were United States foresters. Now only one member of the faculty is from the States.

Research work in forest products utilization is being resumed despite the loss of testing machinery, dry kilns and experimental preservative equipment. The U. S. Army, after the liberation, had helped restore some of the facilities needed for its own purposes. As a result, the school has a nucleus around which to rebuild. But it will need the help of all who have books or other teaching materials to spare.

The wood-using industry of the Philippines is keenly interested in the possibility of the school's starting courses in such practical needs as saw filing, machinery layout and maintenance, lumber grading and in-

spection. More men with such training and experience are badly needed; they could do much to improve the quality of the product and thus help assure a good export market for Philippine *lauan* and other valuable species.

On Mindanao we had noted, at Nasipit and at Anakan, the use of LST's and landing barges for moving lumber between the islands and in lightering from the dock through the shallow water to the deep draft freighters standing off shore. These pieces of war equipment, as well as Army tractors, bulldozers and prime movers, were being used to produce logs and lumber for peacetime building. The age-old appeal for "Beating swords into ploughshares" was being carried out all over in the Philippines.

It was at Anakan also that I saw one of the largest creosote treatment plants in the East. Piling and narrow gauge railroad ties were being creosoted for a Sumatra sugar establishment. Just as at Dehra Dun, India, and at Kepang in Malaya, prewar research at Los Banos had shown the advantage of preservatives in lengthening the life-in-service of ties, piles, poles and posts.

The American superintendent of this plant told me that demand for treated timbers was so great that a profitable business was assured his company for a long time to come. Here, as throughout Asia, the enterprising operator who can provide facilities for preservative treatment of timber, or for kiln drying of lumber will be filling an urgent need for a growing line of customers.

As one forester told me, "During the war, we Filipinos fought side by side with you Americans as guerrillas and as regulars against the Japs for liberation and Independence. Now we are in business for ourselves, thanks to the American government which kept its promises. With the help of American technicians and supervisors, we hope to make good use of our forests and fertile soil to produce shelter and food for ourselves, for Asia, and for trade outside our region. Just as you Americans did not use the Philippines as a mine of raw materials, so we hope to develop, not mine, our forests and other resources for continuous production."

In many respects forestry and timber utilization activities in Australia and New Zealand were much like the situation in the Philippines. Undoubtedly it was the general atmosphere of urgency to produce and to build. This seemed to be true in Queensland, in New South Wales, in Victoria, and in South Australia, as well as in both South Island and North Island of New Zealand.

The Australians and New Zealanders have been in business for themselves a long time. Both have sizable land areas which can support much larger populations. And as they grow, housing is critically needed in both countries. As exporters of agricultural products, both are anxious to bring up their industrial development to keep pace with their farming activities.

In Queensland, for example, I saw their local adaptation of a Swedish twin-circular saw set up to convert thinnings from hoop pine plantations into fruit box boards. The plantations of this native pine, an *Araucaria* of the same genus as the parana pine of Brazil, grow so rapidly that this fast cutting sawmill was needed to keep up with the trees. The growth of exotic pines from southern U.S.A. are also doing remarkably well in Queensland.

The most phenomenal growth was being made by our Monterey pine, a native of California, in plantations in South Australia and Victoria. And the quality was good enough so that the lumber is being used for building houses in government as well as private industry housing projects. Because growth rates have been so good, and because Australia needs, in addition to its supplies of eucalyptus, large quantities of softwoods, both the state governments and the commonwealth government devote much effort to nurseries, planting and care of the plantations. Displaced persons from Europe have been brought in for work on the plantations. Thus growing trees and growing populations seem to be merging nicely in Australia.

I was informed by Australian foresters that there was growing concern over the large area of cutover nonproductive eucalyptus forests. In many parts of the country the fire hazard in these forests is extremely high. In Victoria, Tasmania and in western Australia, a combination of unfavorable weather and accumulated debris after logging resulted in forest fires almost as destructive as our own Tillamook burn in Oregon.

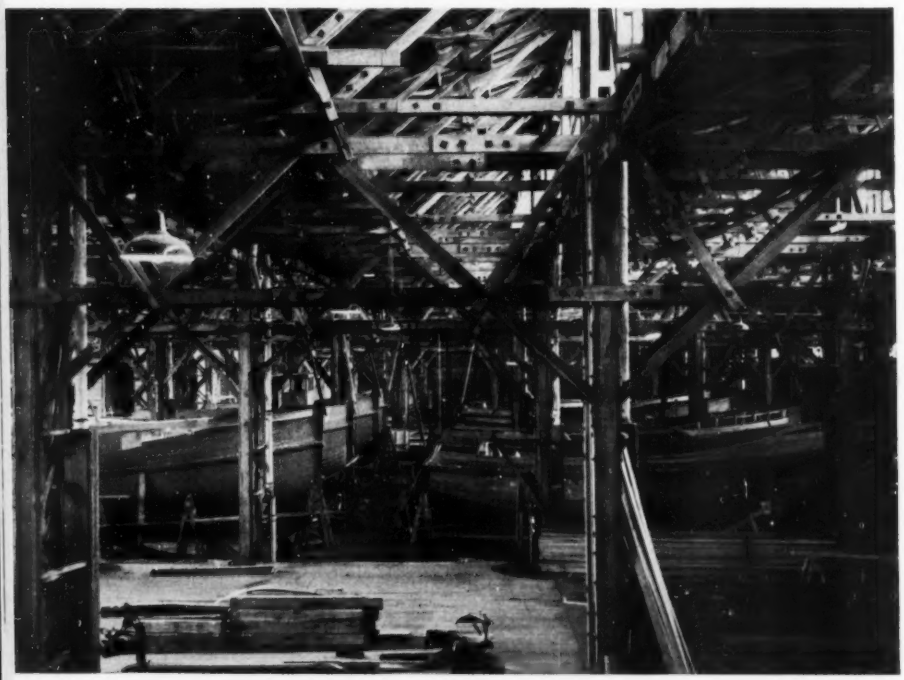
Much of this fire-killed timber, in Victoria at least, has been salvaged for pulpwood, lumber and even veneer.

At Canberra I visited the Australian Forestry School, one of the best in the East. In addition to academic courses, the faculty makes sure students learn the practical and applied side of their profession.

The boys must spend an important part of their time in field work in each of the major forest regions of Australia—in the *karri* and *jarrah* forests of western Australia, the mountain *eucalyptus* forests of Vic-

(*Turn to page* 40)

Interior view of the United Ship and Boat Builders, Limited, at Auckland, New Zealand. Wooden hulled tugs are being built in assembly line fashion



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The Hoover Report on Interior

By NORT BASER

In its April issue, *American Forests* presented "Conservation and the Hoover Report" in which G. H. Collingwood interpreted the conservation aspects of the Hoover Commission's recommendations for regrouping the Department of Agriculture activities. This digest of the Hoover report on reorganizing the Department of the Interior completes the conservation picture. The complete Hoover Commission reports may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D. C.

The overall future for conservation, as conceived by the Hoover Commission, can now be studied in all its phases, since the report to Congress on reorganization of the Interior Department has been added to its previously discussed recommendations for regrouping of activities within the Department of Agriculture.

This latest report by the twelve-man bipartisan Commission makes fifteen specific recommendations in proposing "That the Department of the Interior be given more clearly the mission of development of subsoil and water resources. As these activities require large public works, we recommend that other public works also be managed by this Department."

Included in these recommendations is a thorough reorganization of the Department of Interior along more functional and major purpose lines, transferring the Bureau of Land Management (except minerals) to the Department of Agriculture, the Commercial Fisheries from Fish and Wildlife Service to the Department of Commerce, and the Bureau of Indian Affairs to a new department for social security, education and Indian affairs.

The following agencies would be transferred to the Department of Interior: Flood Control and Rivers and Harbors improvement from the Department of the Army (any Army engineers who can be spared from military duties would be detailed to the Department in positions similar to those which they now hold in the Corps of Engineers), Public Building Construction and Community Services from the Federal Works Agency, and certain major construction (such as governmental housing) to be assigned on behalf of other agencies of the government, except where carried on by grants-in-aid programs.

It will be recalled that the Hoover Commission's agricultural report recommended that Bureau of Land Management be incorporated in a new bureau with the Forest Service, contending that both functions were agricultural in nature. This union would operate under an Agricultural Resources Conservation Service.

At that time it was noted that some Commission members did not agree with this view, but favored instead a Department of Natural Resources to replace the Department of Interior, the new Resources Department to include a Bureau of Forest and Range Service embodying Forest Service, Land Management and Forest Insects and Disease Research.

The majority of the Commission members, however, recommended a reorganized Interior Department, with its functions to be assigned to four services. A Water Development and Use Service would be responsible for reclamation projects, rivers and harbor improvement, flood control, the Bonneville and Southwestern Power Administrations and the Division of Power. A Recreation Service would administrate national parks and monuments, plus wildlife and game fishing. Building Construction and Mineral Resources would consolidate their related functions in separate services on the same level of authority.

There would also be Drainage Area Advisory Commissions comprised of representatives of Interior's Water Development and Use Service, the proposed Agricultural Resources Conservation Service in the Department of Agriculture and from each state concerned. The purpose of these drainage boards would be to coordinate and advise, rather than to administrate.

All these services in turn would be responsible to the Secretary of the Interior who would have an administrative staff consisting of an under secretary, three assistant secretaries, an administrative assistant secretary and a solicitor.

To check on the public and economic value of projects proposed by the Department, the Hoover Commission recommends the creation of a Board of Impartial Analysis for Engineering and Architectural Projects which shall review and report to the President and to Congress. The Board would periodically review authorized projects and advise as to progress or discontinuance. The Board would comprise five members of outstanding abilities in this field and would be appointed by the President and included in the President's office.

A more significant role in future irrigation or reclamation projects is also recommended for the Department of Agriculture through a stipulation that before the Interior Department undertakes such measures it should first clear with Agriculture's Board of Review. It is pointed out, too, that the laws pertaining to the Bureau of Reclamation need clarification and codification. When any construction and operation plans involve international streams, the responsibility for negotiating international agreements would fall to the State Department.

No accurate estimate of savings which would result from this reorganization was made by the Hoover Commission, but it was agreed the sum would be large because of its prevention of "unwise projects and disastrous conflicts, by securing coordinated policies."

The minority National Resources report is completely aired by its advocates (Vice Chairman Dean Acheson, James K. Pollock and James H. Rowe, Jr.) in the pages of the Interior report. This group argues that "the conservation, development and use of our public resources is a single

(*Turn to page* 46)

"Keep the fire out and the trees will grow!" Here's a sturdy "Caterpillar" Diesel D4 Tractor with Mathis 2-disc plow helping do just that—building a firebreak for the Florida Forest Service near Port St. Joe, Florida.

Handy Husky

EVEN when you put one of the smaller "Caterpillar" Diesel Tractors to work for you, you're not sending any boy to do a man's job. Both the D2 and the D4 are sure-footed, two-fisted huskies that can dish it out and take it whatever the assignment—pulling fire-line plows, fighting fires, building roads, pulling tree planters or going in and getting out pulpwood.

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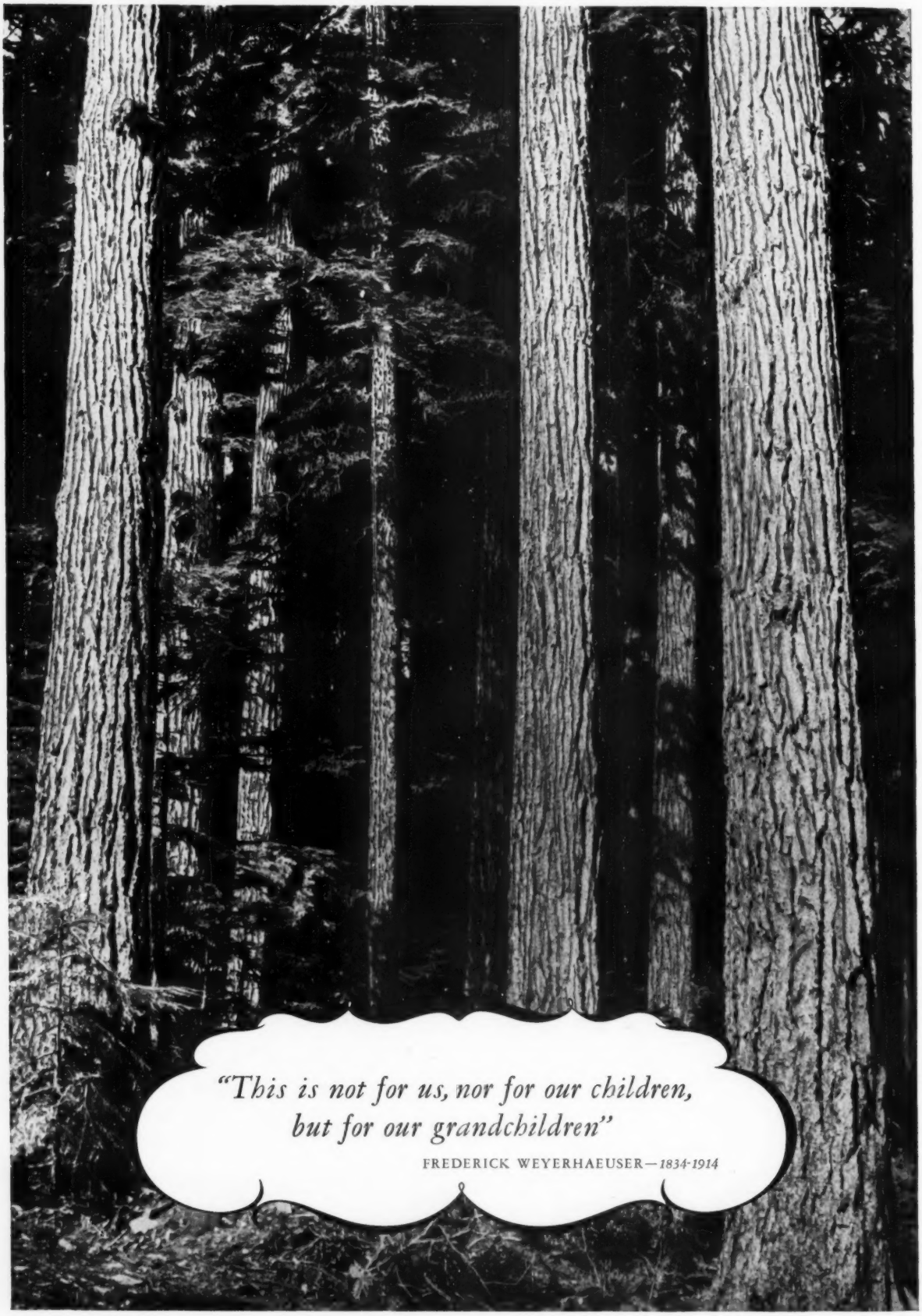

"This is not for us, nor for our children,
but for our grandchildren"
FREDERICK WEYERHAEUSER—1834-1914

Trees and Homes

The Weyerhaeuser program of tree farming means there will always be good lumber for good homes

TIMBER IS A CROP—it is one of the few major renewable resources. It is a crop that requires planned harvesting, regrowth and protection.

Careful harvesting removes the mature trees and releases forest land for the young growth, for natural re-seeding and supervised planting. Good forestry practice protects the new growth from such forest enemies as fire, insects and disease.

This is the concept and practice of Weyerhaeuser in the management of timber resources.

As a result of continuing research, Weyerhaeuser mills and processing units, with improved machinery and more efficient methods, are converting more and more of the log into better lumber and other useful forest products.

Weyerhaeuser 4-Square Lumber is properly dried—it is precision manufactured to exact lengths and sizes, and accurately squared—it is ready-to-use as it comes from the mill . . . without needless sawing, fitting, or material waste.

In addition to product refinement, skilled designers and competent engineers have been retained in the creation of two dependable building services—the Weyerhaeuser 4-Square Home Building Service and the Weyerhaeuser 4-Square Farm Building Service.

These Services, available through retail lumber dealers, are assisting home planners and farmers to employ lumber in ways that extend the number of years of its service. This not only helps to conserve our forest resources but contributes to building economy as well.

Our forests are rapidly approaching the basis of a sustained yield at which the new growth will equal the harvest . . . and lumber, the best and most economical building material, and other forest products will be available to serve America today, tomorrow, and for generations to come.

WEYERHAEUSER 4-SQUARE
LUMBER AND SERVICES

FIRST NATIONAL BANK BUILDING • SAINT PAUL 1, MINNESOTA

As Industry Sees the Forest Situation

(*From page* 12)

lion acres certified as under protection and management for continuous crops of timber are now participating in this undertaking.

A decisive factor on the credit side of the forest ledger, often overlooked in forecasting the future, is the outcome of research by forest industries and public agencies in forest management, harvesting, utilization and marketing of wood. This has resulted in the profitable use of wood, which, because it could not pay its way, was once left in the forests or burned at the mills.

Under economic conditions that existed twenty-five years ago, and with equipment then available, smaller trees were knocked down when larger ones were harvested. Today, many Douglasfir operators, using specially designed small equipment, log the small trees first. This is called "pre-logging." After the small trees have been salvaged, the big trees are cut. Following this operation, a third type equipment is used to harvest the small top logs, pulpwood, posts, etc., which are left from the large trees. Such techniques, increasingly used in conjunction with other modern methods of logging, actually extend the supply of old-growth timber much longer than originally anticipated.

Those who assume that timber consumption will continue at the high rate of the present abnormal period ignore the economic history of the lumber cycle which has followed much the same pattern since the Civil War. Each conflict has been followed by a building boom. The present one has lasted longer than usual because no construction, unless essential to the war effort, was permitted during the war, and housing construction was sub-normal during the pre-war depression of the thirties.

More housing units—1,250,000—were provided in 1948 than any prior year in the history of the country. The capacity of the mills has been taxed for several years, and it is estimated that total lumber production in 1948 will approximate thirty-six billion feet.

This abnormal consumption will not continue indefinitely. Already, there are signs of tapering off. Lumber supply has caught up with the demand. Since the first of July, new orders have been ten percent less than production, and the gap is widening month by month. The best authorities agree that unless there is another national emergency, building and construction will probably decline in 1949.

Thirty years ago both government and private operators agreed that the South was on the verge of being completely cut out. Today, harvesting second, third and even fourth-grade timber, the South is producing more lumber and pulpwood than any other region. The U. S. Forest Service estimated standing southern sawtimber at 199,297,000,000 board feet in 1933 and at 323,961,000,000 feet in 1945, despite the fact that the region continued to produce an annual average of ten billion feet of lumber and four and a half million cords of pulpwood during the period. This was possible because millions of acres of small trees matured into board-foot size.

"JOE BEAVER" By Ed Nofziger

"Are these the trees for tomorrow you were telling me about, Pop?"

The foregoing factors which point toward an early balance between timber consumption and growth are emphasized because they have usually been ignored. However, it is proper that they should be weighed with the unfavorable factors in arriving at a fair estimate of the future of the nation's forests. That unfavorable factors exist, the lumber industry is well aware.

One is the reduction in average size of sawtimber cut today as compared to that of twenty or more years past. Part of this is due to the gradual disappearance of virgin stands of old timber. This is a contingency which all foresters recognize as inevitable and, in itself, of minor significance in any permanent forest program.

It is obvious that when the last of the forty-one million acres of virgin growth is harvested in the western United States, the average tree cut from second-growth will be smaller than the trees cut today. This does not present an insuperable problem, however. Developed in recent years, gluing and laminating techniques make it possible to produce tailored timbers of any size. They are fabricated from small pieces, and are equal in performance to the solid members.

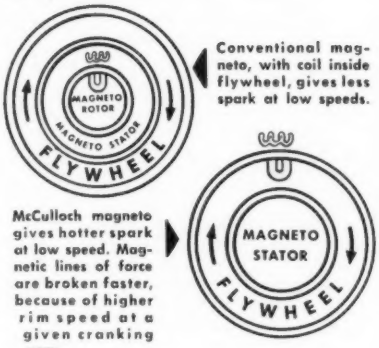
The growth of so-called "weed trees" which follows the harvesting of desirable species in various forest regions is another problem. This is being solved by a two-fold approach. The techniques of good forestry practices seek to maintain the more valuable while reducing the less desirable species to a minimum. Secondly, methods are being developed to utilize trees once considered weeds.

The accessibility of the country's standing sawtimber has been questioned. One of the obvious tendencies of forest harvesting is the cutting of the most accessible stands first. As areas containing sawtimber become more remote and difficult to reach, new logging methods and equipment must be developed. The statement that most sawtimber is scattered in unmerchantable stands is best answered by findings of the U. S. Forest Service. The nation has 840 billion board feet of sawtimber in virgin stands and 661 billion board feet in merchantable second-growth. Only 100 billion board feet are located in unmerchantable stands, that is, stands where the volume of trees per acre is too low to justify logging at this time. These areas will become economically usable as volume increases and new and more practical methods of harvesting are developed.

A serious obstacle in the path of maximum forest production is the existence of millions of acres of forest land which, due largely to repeated forest fires, are now classed as unproductive. The answer to this problem is in tree planting and in otherwise assisting nature in re-establishing tree growth. At the present time, approximately six million acres have been successfully planted. The statement has been made that at the present rate of progress it will require hundreds of years to complete the job. Such a statement, like many others regarding forest resources, assumes a static condition and takes it for granted that no improvement is taking place. In reality, substantial progress is being made.

(*Turn to page* 34)

Here's Why McCULLOCH Saws *start fast... and cut fast*



Conventional magneto, with coil inside flywheel, gives less spark at low speeds.

McCulloch magneto gives hotter spark at low speed. Magnetic lines of force are broken faster, because of higher rim speed at a given cranking rpm.

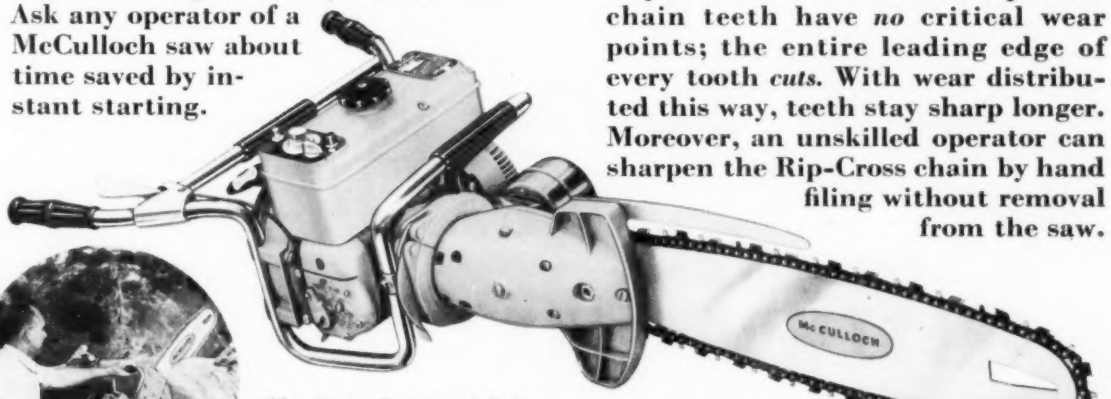
THESE FEATURES MEAN LESS TIME ON ANY FORESTRY JOB

they start fast

The sketch shows how the McCulloch magneto differs from the conventional type. At any given cranking speed, magnetic lines of force are broken faster, giving a hotter spark at low speeds. The hotter spark means faster starting, in theory and in fact. Ask any operator of a McCulloch saw about time saved by instant starting.

they cut fast

The special curved teeth of the McCulloch Rip-Cross chain, driven by 5 honest hp, actually scoop out the wood—with or against the grain or at any angle, in any kind of hard or soft wood. And here's another important time-saver: the Rip-Cross chain teeth have *no* critical wear points; the entire leading edge of every tooth *cuts.* With wear distributed this way, teeth stay sharp longer. Moreover, an unskilled operator can sharpen the Rip-Cross chain by hand filing without removal from the saw.



The 20-inch saw with its weight of only 49 lbs. and full-swivel blade, can be easily operated in any position by one man.

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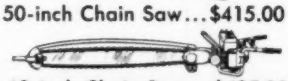

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20-inch Bow Saw $425.00

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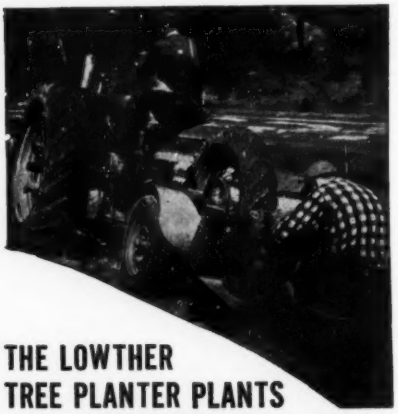

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By The Makers Of The Famous Lowther C-Saw

The ownership pattern of American forest lands presents a difficult problem. The largest single classification consists of small tracts of less than 5,000 acres, owned by more than four million individuals. In this classification is found the most indifferent forest management.

In past years, many attempts have been made to influence these owners by use of educational programs and, because this is an inherently slow process, education is considered by some to have failed. It cannot be denied that these attempts have been sporadic and often shortlived. Until very recently, nearly all of them suffered from a fatal weakness: *lack of an impelling motive.*

As long as this nation had vast uncut forests, there was little opportunity for the small woodland owner to market his logs at a profit, and certainly no incentive for him to grow trees as a business.

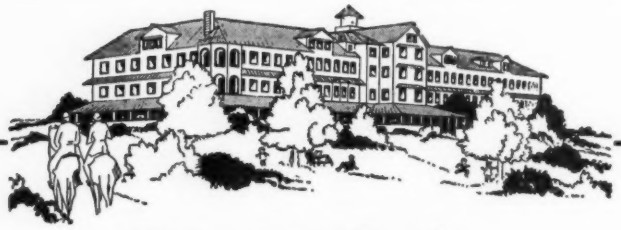
For the first time, it is possible to appeal to the profit motive. Landowners can now be told, truthfully, that growing and harvesting crops of trees is a profitable business. Many small owners, who once believed that timber land burned over and used for grazing was more valuable than when used as a fully stocked wood producing area, have changed their minds. They now see prospects of more substantial and adequate returns in production of pulpwood, poles and timber than in the growing of hogs, sheep and cattle. The profit motive is giving point and purpose to education in forest practices.

In any consideration of the broad phases of forest policy, it would seem to be the more intelligent course to search our own experience for the ways and means of achieving reasonable objectives. The provisions of the Clarke-McNary Act for the control of forest fires are an outstanding example of national policy based upon the appraisal of such experience. This law was founded, in principle, upon due consideration of the interests and the responsibilities of all those concerned—the various types of owners and the public. Everyone benefits from the forests, and everyone shares responsibility for protecting them from fire. The successful application of this principle of share benefits and shared responsibilities now has resulted in the extension of the same principle to the field of insect and disease control.

Available facts and figures show a continuing improvement in the condition of the nation's timber resources. Improved forest fire protection, coupled with the industry-sponsored "Tree Farm Program" and contemplated improvement in insect and disease control, will in the near future find our timber resources increasing yearly.

As the techniques of forest land management are further improved, and as the millions of woodlot owners learn of the profit advantages in their application, America's forest resources will continue to supply all of the nation's demands for forest products.

A super hard wood—cigarette-proof, alcohol-proof and with its natural wood grain intact—is the newest product of lumber industry research. And it's made from softwoods. The product, a compressed wood called Staypak, was perfected by the Western Pine Association Research Laboratory in Portland, Oregon, and is now ready for commercial manufacture. Staypak differs from other hard-boards made of compressed wood fibers in that it is the result of compression of a whole board down to approximately a third of its original thickness. It is from three to ten-fold stronger than the original wood.



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At Crestmont the "gracious way of life" is a tradition. Unexcelled food and courteous service . . . congenial, conservative people like your friends at home . . . and most important —peacefulness that invites rest and relaxation. No mosquitoes. Playground with kindergartner.

Write for folder.

The CRESTMONT INN

Eagles Mere, Pa.

W. T. DICKERSON, President

Posting Is Not Enough

(*From page* 13)

while the beautiful and graceful gray squirrels will go for the acorns, hazels and other nuts.

When it comes to fish, the old idea of "clearing" streams, pulling out all obstructions and leaving them straight, bare channels between walls of rounded stones should be discontinued. Not only is this a detriment to the fish but it also increases the danger of floods by allowing the sudden, unimpeded rush of water from melting snows and spring freshets. Yet, I can recall several places which only a few years ago were "improved" in this manner.

The cutting of trees and brush along the banks has also been much overdone in this country. Such growth not only provides much-needed game cover but it holds the banks and prevents silting. In addition, it provides a welcome shade for fish.

A few brush or stone "wing" dams built in the streams by sportsmen's clubs with the owner's permission, or tree trunks felled in the right spots, will go a long way towards creating suitable spots for the fish. Keeping cattle out or allowing them to enter only at certain places, will also help a great deal in maintaining streams suitable for fish. In the case of ponds, it has been found that scattering a little ordinary fertilizer on the water occasionally will so increase natural fish foods. The fish will respond greatly both in number and size. Why not do a few of these things?

It is not enough to merely render lip service to conservation. Something active must be done. Game preserves and refuges are a great help, but they are not enough. Sportsmen must respect the farmers' rights, and both farmers and sportsmen should work together for the best results.

Individual sportsmen and organizations can help by offering their services to farmers or to conservation groups. They can feed birds in winter or, at least, supply the food; they can stock the newly-made game covers, the streams and ponds; they can offer to plant wild rice and other aquatic foods; and can fertilize ponds. So, let us all pull together and have some real conservation instead of leaving it all to "the other fellow!"

K&E Instruments for forest work are made with the same care and precision for which all K&E products have been renowned for 82 years.

K&E Forestry Equipment includes the K&E Swedish Increment Borer, made of the finest Swedish steel, K&E Tree Caliper, K&E Swedish Bark Measuring Instrument, K&E Timber Scriber, K&E Forester's Compasses, K&E Topographic Abney Levels, K&E Topographic Tapes and K&E WYTEFACE* Diameter (Tree) Steel Tapes.

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Mt. Hood

(*From page* 15)

this is so. Another reason is its picture-book appearance. As one English visitor put it, "It looks just like a mountain should look."

Last year (the safe climbing season lasts from June to September) more than 2000 people reached the summit. Many of the climbs were organized by the Mazamas and other northwestern mountain clubs. These groups usually number about fifty people. One, led by the Hood River Crag Rats, had 400 climbers. Successful ascents have been made in summer clothes and low shoes, but any climber who goes on such an outing is tempting fate.

Seasoned climbers never attempt Mt. Hood when they see white clouds turning lazily about its snow-capped summit. They know the slowly circling clouds conceal winds strong enough to blow a man off the side of the mountain.

From the knife-edge summit you can see the entire Mt. Hood forest area. At that height the firs and hemlocks are indistinct masses, the rocky ridges mere brown lines on a green map. The bright spots in the timbered world are the forest lakes.

Most famous of these is Lost Lake, on the steep north slope of Mt. Hood. Protected from winds by high peaks, it is a smooth natural mirror that reflects the mountain in moonlight as well as in sunlight. Hundreds of pictures have been made of this natural mirror, but no photographer is satisfied when he leaves. No camera can capture the perfect setting of mountains, trees, water and sky that is Lost Lake.

And there's still plenty of fishing in the Mt. Hood wonderland. Irvin S. Cobb once wrote that "Somewhere in this continent there may be better trout fishing than in Oregon, but I haven't found it."

Cobb's favorite fishing spot was east of the Mt. Hood recreation area, in the Deschutes Valley, but he also praised the trout streams that roll down the rocky eastern slopes of the Cascades. Although only a two-hour drive from Portland's 300 thousand people, some of the streams in the vast Mt. Hood forest are fished but once or twice a year. The trip in is rugged, but rewards are ample for the angling enthusiast who'll make the effort.

'That Whittling Warther Boy'

(*From page* 23)

being operated on an electrically driven belt, and the oily wood makes it unnecessary to oil the parts.

In a flower patch next to the shop is the museum. Both have huge locks on the doors, one a padlock from a German castle, the other an old-fashioned lock which works with an enormous brass key. Neither is used, for Warther doesn't lock up his treasures. People are honest, he says.

The locks, like many other things belonging to the Warthers, are curios. Both he and his wife are collectors. She has a splendid lot of buttons, arranged in beautiful designs and displayed in the museum. He collects Civil War mementos, especially those connected with his hero, Abraham Lincoln. Even their garden was "collected."

Last year Dover honored Warther with a public dinner. At that time he displayed the model of the steel mill in which he once worked. He put in models of the seventeen men who had worked with him, giving each his characteristic position and job. These men, the fourteen still living, came to the dinner.

Looking at the electrically-operated model, Jim Phillips saw himself running the roller, with Dave Medley managing the heat for him and Henry Weigand "catching." Clarence Gordon was there with his characteristic red bandanna in his pocket. Johnny Stutz was eating a piece of his favorite rhubarb pie from his lunch bucket, and Fritz Richards was sitting beside him, impatiently rattling the tongs to get them back to work. Those Dover steel workers got a thrill seeing themselves at work again, in miniature.

In all, this master carver has thirty-six models on display. Many are on the road, but he keeps quite a few with him at the museum. He is considering starting a Diesel engine, though reluctantly. "They haven't got the parts to them that a steam locomotive has, won't be nearly so intricate or interesting to carve."

Washington Lookout

(*From page 5*)

000; forest development roads and trails, $9,748,000.

The bill may be amended in the Senate, but even there it is unlikely that the appropriations will exceed the budget estimates.

The only House amendment to the bill on the Forest Service items was one increasing the scope of the forest and range research. Representative Stefan of Nebraska inserted "shelterbelts" in the research coverage.

Forest disease investigations under the Bureau of Plant Industry received $384,480, the same as in 1949, but the Department is requested to give "appropriate attention to the investigation of pole blight disease of white pine" and to allot not less than $40,000 for little leaf disease of southern pines.

Gypsy and brown-tail moth work was decreased $54,600 below that of 1949 because "recent developments in methods of control should enable the Department to do all necessary work with less funds." For forest pest control survey $272,300 was allowed.

White pine blister rust funds were reduced by $161,000, and $25,000 were earmarked for a review of the plan of operation with special reference to bringing about greater measure of cooperation on the part of the states and owners of private timberlands.

For flood control $8,975,000 was approved, which is $2,975,000 above the 1949 figure, but $1,025,000 less than the budget.

Soil conservation operation funds were substantially increased above the budget estimates, but funds for soil conservation research were drastically reduced. Chief purpose of the increase is to initiate action on 171 new district projects, while research in this field is believed by the committee to have reached the point where it is essentially a by-product of the operations activities.

While the House was paring away at National Forest funds, the Senate passed Joint Resolution 53 providing for greatly increased expenditures—up to $10,000,000 for reforestation by 1955 and $3,000,000 for revegetation of depleted range lands.

The Senate also passed S. 979 to provide additional funds for the work of the Forest Service in extending and intensifying the forest survey—total $2,500,000 annually.

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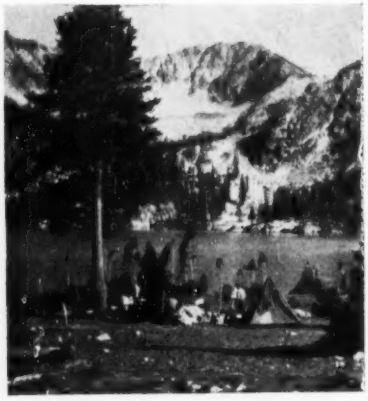

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Chips on The Land

(*From page* 17)

erating at 2,200 revolutions per minute, creates an air pressure strong enough to blow the chipped wood fifteen to twenty feet from the machine.

Bill O'Rourke, crew foreman who has spent a considerable part of his life with the Water Supply Board, prefers to take visitors on a bit of a tour, beginning with the earliest job in which the chipping unit was used, before he shows the machine in operation. At the site of the first operation one can see only pine needles on the forest floor. It's necessary to brush the needles away to find any chips, and even then it's impossible to get a clear sample of the chips, so thoroughly has nature mixed fallen needles with them.

One can note the soft and decayed appearance of the chips. Rubbed between the hands, the chips become a fluffy mass of organic matter. Only the larger chunks are recognizable, for in two years they have reached an advanced stage of decomposition. At another plantation worked over just a year ago one must still scrape away pine needles to find chips, but decomposition isn't nearly as far advanced.

Bill is then ready to show the machine in action on a plantation of mixed red and white pines. As a result of damage by the white pine weevil, nearly all stems of this species have been overtopped by the red pine and are being removed. Two men are cutting down the marked trees while others are chopping off the side branches and tops. Crews are piling tops and branches with butts pointing toward a central clear alley-way between the rows of trees. Bill explains that the chipper will start work in a few minutes. It does its job so rapidly that it's necessary to operate it only a couple of hours each day.

The starter button is pressed, the machine starts with a roar, and the operator climbs into the jeep and starts driving toward the cleared alley-way. Men start feeding tops and branches into the chipper's wide mouth. Butt ends are fed first so that the end comes in contact with the revolving disc which carries the cutting knives. The machine does the rest. In a few seconds the entire branch has been drawn through the chipper.

A pile of branches originally as big as the jeep itself can now, in the form of chips, be placed in a bushel basket. Bill enumerates the advantages of the machine: "Before we had this machine we burned all our slash. Of course we had to stop woods work just as soon as spring or fall fire season came along. Now we can work summer or winter, spring or fall. As far as this machine is concerned there just isn't any fire season. We used to destroy all of this organic matter when we got rid of our slash by burning it. Now one man scatters the chips over the ground if the piles are too big, and they'll soon be part of the soil. And it's costing us less than half as much."

Forest fire has been and still is a major problem in Rhode Island. Philip Holton, Jr., chief engineer, suffered many sleepless nights worrying about destruction which fire might bring to watershed forested areas. His worries increased as the many plantations reached young "treehood."

This is where the chipper is helping out. It has helped solve the problem of fire protection by providing a financially feasible means of disposing of the slash resulting from thinning and pruning operations.

In a word, the chipper is serving as an effective fire protection tool and is aiding in the reduction of the Board's most serious problem. Engineer Holton feels a little more optimistic these days. And he's well on the way to insuring a water supply for Providence and its environs.

Results of this operation have encouraged others in increasing numbers to give the chipping machine a trial. When agricultural uses are being considered, chip size is an important factor. Chips produced by a machine equipped with ordinary straight-edged knives are too large for any farm use except orchard mulch. Much smaller chips can be produced by replacing alternate knives with especially designed "sawtooth knives." Chip size can further be varied by changing the adjustments.

Chipping units at present are too expensive to be owned by the average farmer or woodland owner. However, no imagination is required to see that they could be owned, operated and made available on a community basis by Soil Conservation districts and similar organizations. The Northeast Region of the Soil Conservation Service has purchased a machine for trial and observational purposes, and information thus gained will be made available to District governing bodies.

Community operation would make it practical for the farmer and other woodland owners to obtain their fuel, lumber and other wood requirements, with chips produced as a by-product from branches and other tree waste. The chips will eventually find their way back to the soil by way of the dairy barn, poultry house or as mulch. Soils so treated, because of their increased organic matter will be more productive, easier to work and less subject to damage by wind and water erosion.

Such utilization of wood chips should be encouraging to woodland owners, foresters and conservationists. There is an almost inexhaustible supply of low grade and other waste material suitable for the manufacture of such chips. Rhode Island alone has approximately 360 thousand acres, or ninety-two percent, of its total forest area covered with stands less than forty years of age, all of which is in need of improvement cuttings and thinnings. Spread over the country as a whole the amount of waste and low-grade material available is unlimited.

Large scale utilization of wood chips would enable the woodland owner to make the cuttings necessary to good management of young forest stands at a profit. Woods waste would theoretically consist only of stumps, leaves and branches from natural pruning.

Truly, it appears we are rapidly approaching an era in which we will use practically all of the tree except the whisper of the breeze overhead.

Youth Hostels in Sweden

(*From page* 19)

ning water, and from two to four sleeping berths. Showers and clothes-washing facilities are of the most efficient design, and self-contained compartments have been installed for the operating staff. It seemed to me that the smartest of all inspirations aboard the *AfChapman* was to engage a real sea-captain, in uniform and gold braid, as "Master" of the ship. He is a retired officer of the merchant marine, a bluff affable sort, fond of young people, and able to explain the mysteries of ships and distant seas. And he occupies the truly magnificent quarters of the original captains of the *AfChapman*, well forward, panelled in priceless mahogany, and with a great roomy quarter-deck on which he can pace with no worry about sudden squalls. The ship will remain open summer and winter as a Stockholm rendezvous of travelling hostellers.

Oddly enough, Sweden's first experiment in solving the travel problems for people of modest means, and with a love of Mother Nature, took the form of providing simple lodgings in the vast and almost uninhabited mountain districts of the Arctic Circle. Little cabins today are to be found all over the Swedish mountain region, providing all the essentials of the temporary occupant, from firewood to bedding to washbowl and teaspoons. Within that wasteland, the Swedish Touring Club clears paths, bridges bogs, provides rowboats, and sets up igloo-like shelters in spots where human beings rarely are seen. At wide intervals are the larger tourist stations, some of which can accommodate 150 visitors. The fee for lodging in the mountain cabins is a bit higher than elsewhere, amounting to forty cents, substantially under maintenance costs.

As far as the writer can learn, the first hostel movement in America began in 1932 in the province of Alberta, Canada. Four Calgary girls, returning from Europe, opened the first hostel at Bragg Creek. It began with one large tent, soon replaced by a log cabin and stone fireplace, with accommodations for 200. It bears the inscription, "First Youth Hostel in the Western Hemisphere." A few months later, the first hostel in the United States was opened at Northfield, Massachusetts.

Whether in America or Sweden, a common problem is to obtain suitable "houseparents" to act as supervisors. Frequently, an elderly farmer and his wife undertake the task and, of course, receive all of the overnight fees. Should there be any cause for complaint regarding a traveler, his membership card may be retained and a report forwarded to the regional committee. Actually, such things seldom happen.

Today, the youth hostel plan is everywhere in Scandinavia, with 120 hostels in Denmark. Europe has expanded the idea in scores of attractive areas and one may travel the hostel route through French Morocco and Algeria, and in Australia and New Zealand.

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Forests in Ferment

(*From page* 26)

toria, the coastal *eucalyptus* stands of New South Wales, the *Pinus radiata* plantations of South Australia and the *araucaria* pine forests of Queensland.

This same practical approach is to be noted in the excellent research work being done at the Forest Products Laboratory of the Council for Scientific and Industrial Research in Melbourne. Along with the Forest Products Laboratory at Madison, Wisconsin, and the Princes Risborough Laboratory near London, England, this is undoubtedly one of the most modern, best equipped, and staffed timber utilization and technology research stations in the world.

The wood-using industries of Australia, especially in pulp and paper, and in veneer and plywood, are eager customers for the application of the latest research findings. It was here that I learned of the careful testing of the strength properties and use adaptabilities of the several hundred species of *eucalyptus*. I was surprised to note that the local common names assigned to many of these species included gum, ash, cedar, walnut, and other United States species names.

The Australian approach to forestry problems was pretty much the same as ours. They didn't hesitate to try new methods to solve new problems. Large-scale salvage operations, road building, fire protection systems, nursery and planting programs, government logging or sawmill operations don't daunt them in the least. The way to find out how to do a job, in their eyes, is to try it and see.

With a little time to train enough foresters, and exchange of information and experience between the Australians and foresters of other countries with similar problems, important progress in conservation, sound wood utilization, and increased timber trade will be inevitable.

Just across the Tasman Sea from Sydney, the North and South Islands of New Zealand are among the most important native sources of coniferous softwoods in the Pacific. The indigenous *Kauri*, or *Agathis*, of which a few large reserves and scattered large specimens still remain, has housed much of New Zealand's people from earliest Maori and white settlement until today.

The *Podocarpus* and *Dacrydium* species which are not so well known in our hemisphere, make up the major part of New Zealand's present-day indigenous softwood forest. In addition there are the native hardwoods, the various species of *Nothofagus* or Antarctic beech, which resemble the same genus in Chile and southern Argentina. Fully as important are the plantations of exotic conifers from this country. Of these, the Monterey pine makes the most outstanding growth.

It was this phenomenal rate of growth that led to a worldwide get-rich-quick scheme. Thousands of acres were planted to Monterey pine and sold to investors with glowing promises of quick and fruitful returns. Most of the investors tired of waiting for their windfall and disposed of their tracts. Thus, like most such schemes, only the promoters benefited at the time.

M. A. Huberman, whose "Forests in Ferment" concludes in this issue, returned to the Orient in March for a two-weeks' intergovernmental conference at Mysore, India, on forestry problems common to countries of Asia and the Far East. Mr. Huberman served as secretary-general at the parley held under the auspices of the Food and Agriculture Organization of the United Nations.

Central objective of the Mysore conference was to enlist interest of countries to a point where forest development programs will be given high priority in national planning and management. Major items on the agenda were protection and development of forest resources, industrialization and immediate problems such as need for providing fuelwood in practically all countries and permanent housing in war-torn areas.

During this same period the government of New Zealand embarked on an extensive forest reservation and pine planting program. As in the case of many of the private plantations, it seemed less important to pick favorable soil than to show big statistics of trees put into the ground. Little or no thought was given to the sawmill and paper mill installations that would be needed to utilize the yield of wood it was hoped to harvest.

Now New Zealand's foresters are busy on the problem of how to permanently utilize the plantations' yield. This is no simple task. Many of the plantations are reaching merchantable size at the same time; new logging, sawmill, and pulp and paper mill machinery are difficult to obtain; and because labor is scarce, it is necessary to provide housing and community facilities for the working force.

Part of the solution is being provided by government logging and modern sawmill operation. Another part lies in the sale of stumpage to private operators and in expansion of private installations, such as the paper mills at Wakatanie, so located, with government approval, as to assure a permanent supply of raw wood.

So, if the growth is wisely utilized, the get-rich-quick schemes will have benefited not only the original promoters, but all the people of New Zealand.

This problem of fitting sawmill capacity to growth rates also is serious in the native mixed conifers. The same methods of government logging, sale of stumpage to private operators whose mills are located with government approval, are applied.

The New Zealand foresters were justly proud of their current forest survey, adapted from methods used by the U. S. Forest Service. They use a combination of aerial photographs and ground sample plot measurement.

When it is completed, the survey is intended to provide an accurate estimate of the volume of *Kauri*, *rimutara*, and all the other valuable timber species, their growth rate, and their accessibility. It should provide a basis for methods of cutting and management of the native *Nothofagus*, *Agathis*, *Dacrydium*, *Podocarpus* and other species, so as to get natural regeneration without depending on exotic pine plantings.

As in the case of Australia, this country needs more trained foresters for handling state forests, for carrying out its planned research program, for expanding government logging, sawmill, preservative plant, and perhaps paper mill operations. Plans for forestry training at Rotorua are therefore an important cog in the growing forestry and timber utilization machine of New Zealand.

Where the forest ferment is not in the bubbling stage, foresters are able to put their best efforts into carrying out plans and programs. It therefore seems logical to expect that when conditions improve in the Asiatic countries, the work of their foresters will proceed.

Foresters are not accustomed to sit on their hands and bewail fate. Their profession requires that they be up and doing—making ready for the day when conditions are more favorable.

But what can they do? Many items have been suggested in the course of these articles. Countries like Malaya, French Indo-China, Indonesia and Siam can try to open up more of their mixed *Dipterocarp* forests, just as the Philippines have done.

Forest schools at Dehra Dun in India, Los Banos in the Philippines, and Canberra in Australia, and those of China and Japan, can continue to hold their doors open to visiting students from neighboring Asiatic countries for professional forestry training. The ranger schools at Coimbatore, India, Pyinmana, Burma, and Phrae, Siam, can do likewise. The local schools in French Indo-China, Malaya, and Indonesia can be expanded to train more men for the subordinate grades and open the way for advanced training of the most promising of these.

Similarly, the experiment stations such as the Forest Research Institute at Dehra Dun and those at Kepang, Malaya, Buitenzorg, Java, and Melbourne, Australia, can provide more opportunities for exchange of research workers. Exchange of research results in silviculture, reforestation and wood technology and preservation can be done through professional journals, of which the *Indian Forester*, the *Malayan Forester*, *Tectona*, the *Philippine Journal of Forestry*, the *Australian Forestry Journal*, and the *Journal of the New Zealand Institute of Foresters* are perhaps outstanding.

Agreement on uniform grades and specifications of lumber and other forest products would be useful in an expanded regional timber trade.

The exchange of experience in correcting the evils of roving agriculture in the tropical and sub-tropical parts of the region would mean a great deal.

All of these things can and must be achieved. FAO through its Far East conference, its regional office, its field working groups, and its Forestry and Forest Products Commission for Asia, can use its facilities to help governments coordinate their efforts in conservation and utilization.

Such joint efforts might even hasten the day when the forestry ferment in Asia and the Pacific subsides. When it does, the foresters of Asia and the Pacific will have a full time job.

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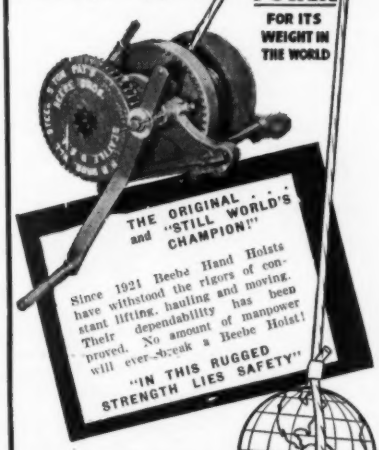

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Cradles of Rivers

(*From page 9*)

drainage systems of some of our large rivers. At Kremmling, Colorado, the Colorado discharges only 108 tons of sediment per square mile, but downstream, at Grand Canyon, Arizona, 1,724 tons. The difference is due to the fact that the upper Colorado drains an area with a rather humid climate, bearing a dense cover of soil-stabilizing plants, while the lower Colorado flows through a region that is largely semi-desert and subject in part to rapid geologic erosion. Also, much of the upper reaches drain national forest or national park lands where overgrazing, fire, and other damaging practices are generally kept in check.

What do sedimentation and streamflow mean in terms of land use? Direct if crude clues to the condition of a watershed can be obtained by observing the streamflow. If a river runs clear after a heavy downpour, we may assume that little or no erosion is occurring on the slopes or along the stream banks, that the land is protected by a good plant cover, and there are few if any "bare spots."

If the stream flows clear but rises quickly during a storm and falls rapidly afterwards, we can infer that the porous soil and rock layers are probably shallow, consequently have a limited capacity to hold back water. This contributes to the swift sub-surface drainage into the channels.

On the other hand, if a stream remains stable or rises but slowly after a storm, and continues to flow at a fairly even rate during a rather long dry spell, the soils are probably deep and porous, and can absorb and hold back relatively large quantities of water for slow release.

A dramatic example of the differences in streamflow was noted in a study by H. M. Stafford and H. G. Troxell of five small drainages in the San Bernardino and San Gabriel mountains in southern California—San Antonio, Strawberry, Deep, and Lytle Creeks, and the West Fork of the Mohave River. With similar prior soil moisture content, the same amount of rainfall produced highly varying runoff. With twelve inches of moisture already stored, a five-day storm yielding eight inches of water produced about a half inch of flood discharge on Lytle Creek, one and a half inches on Strawberry Creek, and over three inches on Deep Creek.

Here was tell-tale evidence about the condition of the watershed lands. Tests showed that Lytle Creek basin can hold about ten and a half inches of water in its deep mantle of soil and fractured rock, whereas Deep Creek basin, with but a thin layer of soil and fractured rock, can store only one inch!

Like the behavior of a river or creek during a storm, the appearance of its banks and channel beds tells us a great deal about the soil and plant cover of surrounding lands. On the tributaries of the Hudson, rising in the picturesque Adirondack State Forest Preserve, or on many headwaters of the Sacramento River below the crest of the Sierra Nevada Mountains, the banks are commonly stable, well-vegetated, and firmly held by the roots of plants. The channel beds are dug in solid rock or composed of smooth, well-worn boulders or gravel. Evidence of recent movements of silt, sand, or debris, is absent, and game fish are abundant. The observer finds that these watersheds below timberline are covered with dense forests, thick-rooted grasses, and shrubs. Indeed, the healthy state of the stream beds, the clear, sparkling water, and fairly regular flow all betoken that the land has been well protected from fire, overgrazing, clearing or destructive logging, and has not been subjected to extensive road building or other activities detrimental to the soil, litter, and cover.

The ultimate effect of the heavy snows that covered many of our western states last winter will be determined in part by the condition of the watersheds. The snows were destructive to life, property, and livestock. In the spring they may be even more destructive than usual wherever the watersheds are in poor condition and snow melt occurs more rapidly than usual. A bountiful "crop" of mud-and-debris-laden discharges—both on the minor and major streams—can be expected in areas where, over the years, excessive logging, forest fires, and erosion-conducive agricultural practices have set the scene for natural devastations.

On the other hand, properly working watersheds will put in their good licks. Flood stages will be lessened by longer period of snow melt, damaging silt and debris will be minimized, and the slower runoff will better be able to replenish underground and surface sources of water for productive summer use of men, plants, and animals.

Where Will We Get Our Seed?

(*From page 21*)

than a pound of seed an acre.

He employs mixtures in which small as well as large germs are present, and in certain regions he need use only the small-seeded species. Even so, direct seeding demands more seed than does the outplanting method; such treatment of half a million acres would require from 125,000 pounds to 250,000 pounds of good seed.

Where would one find so much? In the past public and private foresters and commercial nurserymen have looked to foreign countries—mostly European, although Japan has been important—and to the forests of America. This has not been a one-way street, as foresters in many other parts of the world have leaned heavily upon American conifers, especially those of the West. For a good many years more western conifer seeds were used abroad than were planted in the nurseries of this country.

Thanks to the Marshall Plan, European foresters are once more clamoring to buy American tree seeds, but today their wants are somewhat overshadowed by those of our own federal, state and private tree planters. Nevertheless, it probably is a reasonable assumption that our imports of tree seeds over a long period ahead will no more than offset the quantities shipped abroad by American collectors and dealers. If that is true, volumes equivalent to the very great domestic demands now anticipated must be supplied from the forests of the U. S. A.

The tree seed business in America is carried on largely by a group of dealers who export and import but in the main do not collect cones—and by several large and many small collectors who sell to dealers and sometimes export directly. Also there are federal, state and even private forestry departments which collect considerable portions of their seed requirements, using fire wardens and other field employees for the purpose.

Because of frequent crop failures, such collection does not appear to promise unfailing supplies for vastly increased nursery stock production; yet under favorable conditions the use of regularly employed field men to collect cones when other work is slack certainly makes sense.

Local crop failures also affect small collectors, who, unless they are mobile, simply go out of business when their local forests fail them. Traditionally, the large commercial dealers have been the mainstay of this busi-

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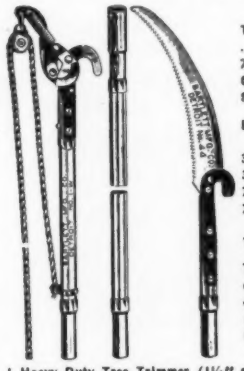

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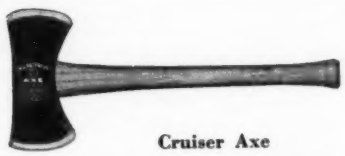

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ness, ferreting out such seed sources as may exist in poor crop years and carrying over large stocks from the times of bounty, thus safeguarding users against complete lack of supplies in lean times. Foreign dealers, foresters in other countries, and our own federal, state and private tree planters alike look to these people whenever they run out of seed.

Yet there is a growing inclination on the part of public foresters to reduce their dependence upon commercial seed sources, partly to obtain their supplies at lower cost and partly because requirements have grown so fast that they could not be met from commercial sources then existing.

Occasionally, too, there has been deliberate intent to play down the dealers, as was the case a few years ago in Japan. At that time, American foresters advising the Military Government of Japan suggested that stocks of tree species desired abroad, such as larch and cryptomeria, be offered first to this and other governments, then to the American states and finally, if anything was left, to private dealers.

Thus several European states and semi-state seed houses, placing reliance on private dealers, found themselves without seed. When the complex situation developed, they were unable to make connections with the confusing Japanese trade setup.

In the opinion of the writer, any nationwide plan for assuring supplies of tree seeds should recognize and make use of the various components in the setup of production and distribution. While federal, state and private forestry agencies should collect cones and extract seed locally, they should make a practice, as some already do of placing substantial orders with commercial collectors and dealers early in the fall. In this way the dealers can plan intelligently and not be forced to speculate on probable demand. And this should be done every year, even when local crops are heavy, so that this business may become stable and capable of meeting demands.

One reason why commercial seed collection should be encouraged and fostered by public tree planting agencies lies in the nature of cone collection. For a state forestry department with a score of field men available at the proper time, it is easy to gather enough cones to produce a few hundred pounds of seed, assuming there is a local crop to be gathered. But it is more difficult and often impossible to obtain a few thousand pounds. The commercial collector goes about the task differently, relying upon hundreds of people who live in and near the woods for the bulk of his supplies, and hand picking with his own employees only such species and quantities as cannot be obtained by purchase.

The local folk obtain cones by robbing squirrel caches, from trees cut for fuelwood, by hand picking and even by shaking trees at the exact moment when cones open. Their numbers are legion, and they like to earn seasonal money, particularly the women and children, and they can be taught simple methods of seed tree selection and cone testing. Indeed, when we succeed in interesting large numbers of country people in cone collection throughout all of the forest regions, the problem of seed supplies will be well on its way to solution.

It is inevitable that there will be fierce competition within regions for such seeds as are available in poor crop years. This can be alleviated by advance planning to obtain all cones that can be found, and by agreement among those needing supplies as to some reasonable rationing basis. On the other hand, it is highly desirable to take advantage of bumper crops by collecting enough to last over two or three seasons.

In recent years we have learned that tree seeds can be kept long periods without losing viability appreciably by freezing—and keeping them frozen until needed. Even the tem-

AUTHORS

ROBSON BLACK (*Youth Hostels in Sweden*) is president of the Canadian Forestry Association. **BERNARD FRANK and ANTHONY NETBOY** (*Cradles of Rivers*) are a watershed authority-writer combination, the former being assistant chief of the Division of Forest Influences, U. S. Forest Service, and the latter a Washington, D. C. writer. **LLOYD F. LENZ** (*'That Whittling Warther Boy'*) is executive manager of the Dover, Ohio, Chamber of Commerce. **M. A. HUBERMAN** (*Forests in Ferment*) is a United Nations forester. **ROBERT A. SCHRACK and L. RUSSELL ALBRIGHT** (*Chips on the Land*) are Soil Conservation Service foresters in Rhode Island. **EDWIN F. STEFFEK** (*Posting Is Not Enough*) is associate editor of *Horticulture*. **JAMES N. WALLACE** (*Mt. Hood*) is a Portland, Oregon writer. **JOHN B. WOODS** (*Where Will We Get Our Seed?*) directed The American Forestry Association's Forest Resource Appraisal—is now in the tree seed business in the Pacific Northwest.

peramental true firs respond to such treatment. So the storage problem has become more than anything else one of financing.

As a preliminary to placing outside orders and planning their own collections, public and private foresters must know as early as possible about crop conditions in the regions where their activities are located. As pointed out, there are five regions with which tree species form unique groups. The South has its four southern pines, cypress and cedar; the Northeast its white cedar, white and red pine, white and black spruce and balsam fir, tamarack and jackpine.

In some of these regions certain European and Asiatic species can be used to advantage, and from some come species greatly in demand in other countries. Furthermore, species found in some regions can be used in others. Thus there are opportunities for looking elsewhere for seeds when local crops are short, and for selling surpluses when they exist. But the first requirement is to know where the crops are.

For many years the U. S. Forest Service regional offices have made surveys of cone crops and circulated their findings. Unfortunately, these have not been wholly reliable, presumably because the men assigned to such work were busy at other tasks, or because they were not acquainted with cone collection or seed extraction. More recently, some of the state forestry departments have undertaken cone crop surveys.

So much needs to be done in order to assure future ample seed supplies that the writer is impelled to suggest that some sort of regional and nationwide agency be created to act as a clearing house for crop data, to unify merchandising methods, set standards of quality and perhaps provide inspection service where necessary.

A live organization combining technical savvy with commercial sense might be most useful. It might be composed of representatives of public forestry agencies, including all state departments operating nurseries, commercial dealers and large collectors, and such nurserymen as are interested in large-scale production of planting stock. It might be called the "Seed Institute" and could be staffed on a part-time basis by details from public and private forestry departments.

Eventually, if it turned out to be really useful, there might be a year-round staff at some central point. Obviously, it should be a fact-finding and advisory agency strictly non-profit in character.

In addition to the tasks suggested above, such a group might assist in lining up collectors so that in poor crop years all available cones are gathered. It might work out new and better schemes for measuring seeds in the market, such as by the thousand viable germs or multiples thereof, instead of by pounds and kilograms as at present. It might schedule regional meetings of collectors and buyers to deal with common problems.

It might even work out a pooling system whereby it would be practicable to finance large-scale collections in good years of seeds to carry over to seasons of low production. Since prices of most coniferous tree seeds range from $5 to $20 or more for a single pound it may be seen that the financial problem can become serious when planning for carrying stocks over.

These are but suggestions, based upon long association with this interesting business. Since state foresters are most worried over future seed supplies, it would be fitting for them to take the lead in sponsoring and laying out the work of such an organization.

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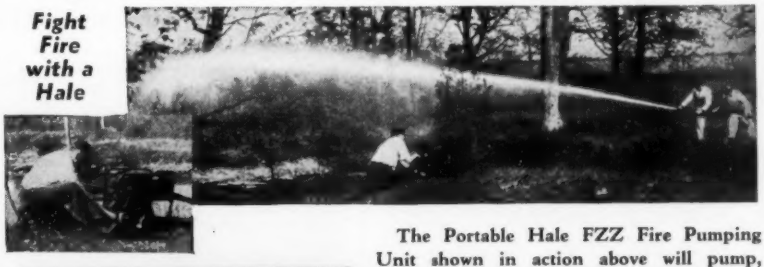

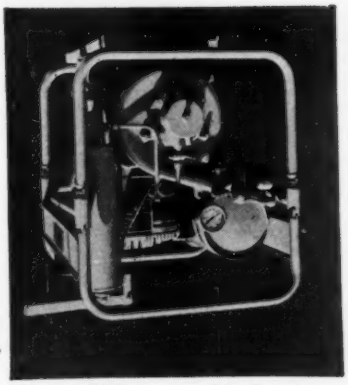

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Hoover Report on Interior

(*From page 28*)

indivisible problem. It can be solved only by leadership of one government agency which would relate each part of that problem—forests, water, public lands, minerals, wildlife, fisheries, recreation, power—to the others and develop all of our natural resources together." They believe this could best be accomplished by a Department of Natural Resources.

Such a Natural Resources Department would include, besides the Forest and Range Service, a Fish and Wildlife Service, Geological Survey, Bureau of Mines, National Park Service, Oil and Gas Division and a Water Development Service.

This minority group contends that "past experience and future need, as well as logic and policy, require that public land and water resources be unified in one agency and that it should be a management agency such as Interior, and not a service agency for one group, *farmers*, as in Agriculture." It sees the Department of Agriculture as a department for farmers and states that the Forest Service has been functioning under that system only from an "organization chart point of view."

It further dismisses the Forest Service farm forestry tie to agriculture as "insignificant" in relation to monies and time expended on that phase, pointing out that such appropriations are actually administered by state foresters and not the Forest Service. It contends that the technical standards of the Forest Service would be extended more widely by merging it with land management agencies.

(Presentation of this agreement is so accomplished as to be highly complimentary to the Forest Service. The group states: "We yield to no one in admiration of that Service. It is a standard for all Government agencies.")

Hand in hand with the proposal for a Natural Resources Department as the key to unification on a national level is a proposal for combining it with regional administration on such independent projects as the Tennessee Valley Authority and other specific watershed areas.

It is significant that the Hoover Commission devoted considerable time and thought before a majority of its members agreed on reorganizing the present Interior Department rather than adopting the Natural Resources approach.

AFA ENDORSES FIRE PREVENTION DRIVE

The American Forestry Association is again cooperating with the Advertising Council, State Foresters and the U. S. Forest Service in active sponsorship of the annual Cooperative Forest Fire Prevention campaign. Theme of the 1949 campaign is carried on reproduction of the basic poster. It is available free of charge, along with blotters, stamps, bookmarks, booklet, newspaper mats, radio transcription featuring Smokey, the fire preventing bear, in "The Dream," plus spot announcements and station breaks. This material and other fire prevention information can be obtained by writing The American Forestry Association, any State Forester or Regional Forester of the U. S. Forest Service, or the Director of Campaign, U. S. Forest Service, Washington 25, D. C.

This Month With The AFA

At its April 12 meeting the AFA Board of Directors approved two projects as part of a long-range program of recognizing the public service work of the Association.

It set up a seven-man committee, headed by Harry S. Mosebrook of the West Virginia Forest Council, to study ways and means of cooperating with state forestry associations and other organizations. Other members of the committee include G. H. Collingwood, representing the Chamber of Commerce of the United States, Robert Hostetter of the Society of American Foresters, William Laybourne of the Ohio Forestry Association, Sam Custer of the Pennsylvania Forestry Association, J. C. McClellan of the American Forest Products Institute, and A. G. Hall of The American Forestry Association staff. A meeting of state forestry association executives has been tentatively planned for June 27 and 28 at Wananish, North Carolina.

The Board also set in motion a plan to prepare a report of forest progress in the nation based on features of the Program for American Forestry adopted in 1947. President A. C. Spurr appointed Ovid Butler, former executive director of the Association, as chairman of the committee to prepare this report. Other members will be named shortly.

Among other matters considered by the Board was approval of a system of conservation awards to be made at the time of the next annual meeting. The awards will be made to individuals in various fields of endeavor.

Annual meeting plans are now being worked out with the dates set for October 12, 13, 14 and 15 at Wheeling, West Virginia. The Ohio Forestry Association and the West Virginia Forest Council will cooperate with the Association in holding the meeting, with two days planned for discussions and two days on field trips in Ohio, largely centered around the Muskingum Watershed Conservancy District. The theme of this year's meeting will be built around the importance of forestry and soil conservation in the use of water.

Members who wish to make their reservations now may write the Association headquarters or direct to the McClure Hotel at Wheeling, West Virginia. Other accommodations will be available at beautiful Oglebay Park which is being turned over to the Association during the four-day conference.

Members who have not had the opportunity of reading "Crisis Spots in Conservation" may be interested in seeing this excellent publication prepared by the Izaak Walton League. Copies are available at twenty-five cents each from the League's office in Denver. The booklet contains a great deal of background material of a factual nature on the principal areas of resource concern in the United States.

New England members of the Association will be extremely interested in reading Federal Reserve Bank of Boston's new 127-page booklet, "Wooden Dollars," on the forest resources of New England. It is wonderfully illustrated with photographs and two color charts. It was prepared by Henry I. Baldwin of the New Hampshire Forestry and Recreation Commission, and Edgar L. Heermance of the Northeastern Wood Utilization Council.

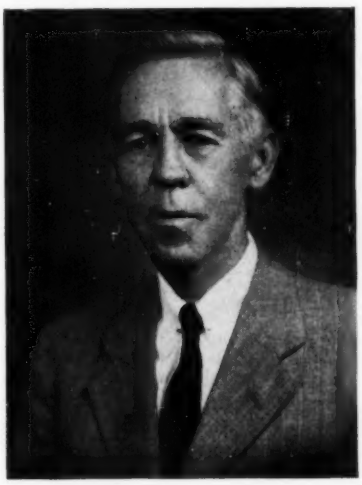
Dewey D. Stephens, Sr., Box 83, Ainsworth, Iowa, a new member of the Association in April, writes us about an interesting collection he has made of 150 varieties of trees mostly native to Iowa. He has worked up the wood into small samples, finished and polished to show off the grain. A number of his sets is now in use in manual training classes in the Iowa public schools.

Enthusiasm in AFA's summer trail-riding expeditions is growing, according to AFA Forester A. G. Hall, who has charge of this activity. Members can now obtain a free copy of the new two color folder describing the fifteen expeditions this summer by dropping us a card.

Arthur W. Priaulx of the West Coast Lumbermen's Association writes that his organization has selected KNOWING YOUR TREES and AMERICAN CONSERVATION, along with eight books on lumbering, as outstanding books for high school use in the West.

Greetings to new life members Miss Bertha H. Hofferberth and John H. Hinman, of New York; Eugene Eberhart Smith and Robert Y. Moffat, of Pennsylvania; William M. Bergman, of Delaware; Dr. E. H. Wenberg, of South America; and Dean Johnson of Oregon.

To Head New AFA Committees



OVID BUTLER, former AFA executive director, named by President Spurr to head the forest program committee

HARRY MOSEBROOK, of the West Virginia Forest Council, directs the Association's committee on cooperation

EDITORIAL

They are Seeing Little Trees

If that master logger, Paul Bunyan, were to visit the Pacific Northwest today, he would rub his eyes in disbelief of what is happening in country long famous for its virgin forests of big trees. Since the days of the legendary Paul, to whom small trees were unworthy of notice, those big trees have been going fast under the impact of world needs for lumber and man's mechanization of big timber lumbering. And with their going, a remarkable change has been gradually coloring the forest picture of the Northwest.

The people are seeing the small trees.

For example, the state of Washington led the nation in the production of lumber for a number of years, reaching its peak in 1929. Since then, due to the rapid harvest of big timber forests, the volume of logs cut and man-hours of labor employed in the woods have fallen off one-half. Year by year, logging camps and sawmills, built to handle large trees, closed down as they reached the limits of their big timber. They represented large investments and each closure was a blow to the business and social economy built around them.

West Coast lumbering, as every one who has seen it knows, has been rough on trees, especially those of small size and of species that would not pay their cost of removal. They were either crushed when the big trees fell or passed by because the markets of the day would have none of them. As a result, cutover lands presented expanding landscapes of broken and devastated forests. Tremendous amounts of wood were left unutilized in the wreckage—and millions of cords were cast aside or burned as waste at the mills.

Washingtonians wrote off millions of these cutover acres as so much dead land. And in many cases forest owners let them revert to the counties in lieu of taxes.

With the passing years, however, there were those who began to see in the cutover areas new life stirring, mothered by the creative power of nature, scientific developments in the utilization of wood and new markets for small wood products.

Stripped-off areas began to green up with little trees which grew with astounding rapidity. As they reached merchantable size, small mills moved in to utilize them—and often the unwanted species of past years. Some of the larger lumber companies, instead of continuing as a one-product industry —lumber—branched into the production of pulp, plywood fibre board and other fabricated material. In the matter of a few years more, progressive leaders of the state caught the vision of twenty million acres within their commonwealth perpetually green with growing trees and alive with new industries, new communities, abundant employment. And in the vision they saw a forest future greater even than that of the big tree past.

Today this vision is more than an imaginative picture. The past fifteen years have translated it into a program of action and accomplishment. Washington has become the first state of the union in the manufacture of plywood and pulp. By virtue of diversification and closer utilization, every thousand feet of logs brought from its woodlands provide eleven hours more employment than in 1929, the peak year of its big timber days. Lumbermen who allowed their cutover lands to revert to counties for taxes are buying them back and joining with present owners who, in increasing numbers, are managing their lands for the growing of continuous crops of wood.

Both the state and industry have established large nurseries to provide young trees to plant lands that will not reforest naturally. Civic and business organizations are cooperating in a forest development campaign under the slogan "Keep Washington Green." The state legislature has passed a long list of progressive laws providing for the protection and management of forest lands.

Within the past two years it passed an act new in the history of state forest legislation, creating a State Forest Products Institute and Commission. After extended study, the commission has just proposed as its initial program (1) a state survey of unutilized wood at sawmills, in logging areas and in thinnings as a source map of material available to present and new wood-using industries; (2) a study of the engineering problem of assembling small and low-grade material for practical processing into different wood products and (3) the establishment of a clearing house for ideas, methods and equipment adapted to small wood logging and manufacture.

Against this forest drama of change, virgin forests of big trees, of which Washington still has several million acres, are becoming lost horizons on the economic skyline of the state's forest future. In their place, little trees grown rapidly to usable sizes seem to be taking the foreground as the foundation of a permanent industry destined to bring to the state more wealth, employment and prosperity than all the big trees that ever came to Washington mills.

To Paul Bunyan all this would not make sense—but Paul lived long, long ago and time and knowledge keep marching on.

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